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Several studies have shown that pioneers have long-lived market share advantages and are likely to be market leaders in their product categories. However, that research has potential limitations: the reliance on a few established databases, the exclusion of nonsurvivors, and the use of single-informant self-reports for data collection. The authors of this study use an alternate method, historical analysis, to avoid these limitations. Approximately 500 brands in 50 product categories are analyzed. The results show that almost half of market pioneers fail and their mean market share is much lower than that found in other studies. Also, early market leaders have much greater long-term success and enter an average of 13 years after pioneers.

Pioneer Advantage: Marketing Logic or Marketing Legend?

The subject of order of market entry is critical to firms' survival and success. Pioneering new markets is expensive and risky, but also potentially very rewarding. If pioneers have advantages in supplies, costs, information, product quality, product line breadth, distribution, and long-term market share (Robinson and Fornell 1985), firms may benefit from early entry. In contrast, if later entrants can leapfrog pioneers with superior technology, positioning, or brand names, firms could be better off entering late (Lieberman and Montgomery 1988). Thus, the extent and nature of pioneering advantages need to be more fully understood.

Several studies have shown that pioneers have long-lived market share advantages (Bond and Lean 1977; Lambkin 1988; Parry and Bass 1990; Robinson 1988; Robinson and Fornell 1985; Urban et al. 1986; Whitten 1979). Some researchers have interpreted these studies as showing that first entrants often become market leaders. The cumulative evidence led Scherer (1985) to conclude that pioneer advantage is a general phenomenon. Though current research overwhelmingly supports the advantages of pioneering, three major concerns remain.

First, two of the main databases used for past research, PIMS and ASSESSOR (Urban et al. 1986), have a sampling bias from including only survivors (Day and Freeman 1990). The exclusion of pioneers that have failed may overstate the advantage of pioneers. Indeed, as time passes after a pioneer has failed, successful firms in the same market may come to regard themselves as pioneers.

Second, PIMS and ASSESSOR data rely on self-reports of single informants to classify pioneers. In the PIMS data, an informant in each business classifies it as one of the pioneers, an early follower, or a late entrant. In the ASSESSOR data, an informant in each firm provides the year it entered the market. Though surveys for these data may have at times contacted more than one informant, they did not collect multiple measures to assess reliability and validity. Such self-reported data by single informants present a potential measurement problem. Respondents, especially if newer employees, may not be well informed about the order of market entry, especially of older products that have existed for decades or longer. Self-perception bias may lead respondents in

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dominant firms to classify themselves as pioneers. This bias may be one reason why 52% of firms in the PIMS data classify themselves as pioneers, including multiple competitors in the *same* product category (Buzzell and Gale 1987; Lieberman and Montgomery 1988).

Third, the PIMS definition of "pioneer" is inconsistent with the term's use by researchers. PIMS defines pioneers as "one of the pioneers in first developing such products or services" (Buzzell and Gale 1987, p. 260). PIMS *does not identify the first firm in each product category even though the researchers who used the PIMS data conceptually define a pioneer as the first entrant in a market.* Therefore, PIMS data are capable of determining only an early entry advantage, not a pioneer advantage. This distinction is critical and not pedantic. For example, if certain early entrants can dominate markets by entering after pioneers in order to learn from the pioneers' mistakes, it would be inappropriate to classify their advantage as pertaining to the pioneer.

Researchers have advocated using new data and research methods to study pioneer advantage (e.g., Lieberman and Montgomery 1988). Different approaches can compensate for some of the limitations of previous research. Our study has three primary objectives.

1. To estimate the rewards of pioneers after controlling for survival bias by studying successful and unsuccessful pioneers. The study examines rewards in three areas: success rate, market share, and market leadership.
2. To demonstrate the use of a new method for studying this phenomenon, historical analysis.
3. To provide an objective measure of the true pioneer or first entrant in each product category by using this method.

In accomplishing these objectives, we hope to provide new insights on pioneering and order of entry. Previous studies (Robinson and Fornell 1985; Urban et al. 1986) addressed order-of-entry effects among only surviving brands. We examine the performance of both failed and surviving pioneers. In addition, we compare their performance with that of early and current market share leaders.

We first present the definitions, background, and method of the study. Then we report and discuss the results. We close with conclusions and implications.

DEFINITIONS

We define four key terms used in the study.

—*Inventor* is the firm(s) that develops patents or important technologies in a new product category.
—*Product pioneer* is the first firm to develop a working model or sample in a new product category.
—*Market pioneer* is the first firm to sell in a new product category.
—*Product category* is a group of close substitutes such that consumers consider the products substitutable and distinct from those in another product category.

More than one firm may be an inventor in a product category because many ideas and processes may be involved in a completely new product. We provide a separate classification for product pioneers because they are not always the same as the market pioneer, but are important players in new markets.

Our definition of "market pioneer" is consistent with that of "pioneer" or "first mover" in other studies. Schmalensee (1982, p. 350) defined a pioneer as "the first appearance" of a brand in "a distinctly new product" category. Robinson and Fornell (1985, p. 305) defined a market pioneer as "the first entrant in a new market" and Urban et al. (1986) defined the pioneer as the first product to enter the market. Lieberman and Montgomery's (1988) review concluded that the standard definition for identifying pioneers based on market entry was appropriate. We use an operational definition for market pioneers that is the same as the conceptual definition. In contrast, other researchers operationalized market pioneers as early entrants that survive. Thus, our study addresses a slightly different issue. Because our study is primarily about market pioneers, we use the term "pioneer" alone to mean "market pioneer."

Product category has long been considered a somewhat ambiguous concept (Day, Shocker, and Srivastava 1979). Determining separate product categories is an empirical issue that may be resolved only in retrospect after the category develops. Our definition is consistent with research that has taken a customer orientation in determining product categories (Day, Shocker, and Srivastava 1979; Loken and Ward 1990; Ratneshwar and Shocker 1991; Sujan and Bettman 1989).

The example of mainframe computers may clarify how our definitions apply. Much of the early research was done during World War II and many firms can be considered inventors. The product pioneer is widely regarded to be the ENIAC developed at The University of Pennsylvania. The market pioneer is Remington-Rand, which sold a Univac to the Census Bureau in 1951. IBM entered in 1953 with a sale to the government research facility at Los Alamos, New Mexico, and had established dominance by 1955 (Shurkin 1984).

BACKGROUND

This section summarizes the theories and evidence for and against a pioneer advantage. Our purpose is not to develop new theory or evaluate current theories, but merely to provide a background for our research.

Theories of Pioneer Advantage

We classify the theories that support pioneer advantage by whether the advantage is based on consumers or producers.

Consumer-based advantages relate to the benefits that can be derived from the way consumers first choose and then repurchase the product. Three of these theories have been fairly well developed. First, Schmalensee (1982) argues that when consumers successfully use the first brand in a new product category, they will favor it over later entrants because they know with certainty that it

works. This reasoning is similar to the argument that consumers develop stable preferences for early entrants (Bain 1956). Second, Carpenter and Nakamoto (1989) use a slightly different rationale by applying learning theory to explain pioneer advantage. This theory argues that the pioneer influences how consumers evaluate attributes in the product category and that the pioneer may become the standard for the product category. Third, Lane (1980) shows how firms that enter early and position near the center of the market can receive higher profits. Further, he shows how first entrants can earn large profits and still prevent further entry. Finally, a pioneer can "lock-in" consumers in categories that have high switching costs. Some of these consumer-based advantages may also apply to resellers (Alpert, Kamins, and Graham 1992).

Producer-based advantages refer to the benefits derived from the supply of the product, and are based on the concept of barriers to entry (Bain 1956). Robinson and Fornell (1985) and Urban et al. (1986) consider them to be major causes of pioneer advantage. For example, economies of scale and learning could lead to lower costs for pioneers. Other important advantages are technological leadership (Gilbert and Newberry 1982; Lieberman and Montgomery 1988; Spence 1981) and preemption of scarce assets (Lieberman and Montgomery 1988; Prescott and Visscher 1977; Schmalensee 1978; Spence 1977). Staying at the forefront of technology enables pioneers to consistently have better products than competitors. Also, when only a limited number of suppliers are present, long-term agreements can prevent them from supplying later entrants. Karakaya and Stahl (1989) review several other barriers to entry that contribute to the producer advantages of pioneers.

Evidence for Pioneer Advantage

The evidence for pioneer advantage comes from three sources: PIMS data, other private data, and the business press. The majority of studies supporting pioneer advantage are based on PIMS data (Lambkin 1988; Lambkin and Day 1989; Parry and Bass 1990; Robinson 1988; Robinson and Fornell 1985). Table 1 summarizes their findings. Note that the market share of pioneers is consistent across all types of goods and firms. The weighted average market share of pioneers is 29%. For consumer goods (Parry and Bass 1990; Robinson and Fornell 1985), the weighted average market share is also 29%. The cumulative evidence from the PIMS data leaves little doubt of a substantial market share reward from pioneering. Similarly, the PIMS data also show that pioneers tend to be market leaders. Seventy percent of market leaders are pioneers, and almost half of all pioneers are market leaders (Buzzell and Gale 1987).

Three studies on pioneering have used other private data. Urban et al. (1986) demonstrated a strong pioneer advantage by using the ASSESSOR data. They found that the second firm to enter the market would obtain only 71% as much market share as the pioneer, and the third firm to enter would obtain only 58% as much. Using the assumptions in their article, Urban et al. (1986, p. 654) estimated the market share of pioneers to be 43.6, 35.7, or 30.8% with three, four, or five brands in a category. Their own database includes an average of 3.6 brands per category. They also point out the possibility of the pioneer failing after a second firm enters. However, they state, "We are not aware of the existence of this situation in the categories we studied" (p. 655). Bond and Lean (1977) carried out a longitudinal analysis of two prescription drug markets and found pioneers have a long-lived market share advantage. Whitten (1979) analyzed seven subcategories of the cigarette market to reach a similar conclusion.

One study reported in the business press (*Advertising Age* 1983) has often been used as evidence of pioneer advantage (e.g., Carpenter and Nakamoto 1989). This

Table 1
PIONEERS' MARKET SHARE ADVANTAGE IN THE PIMS DATA

	Market share (%)			
Study	*Pioneer*	*Early follower*	*Late entrant*	*Advantage pioneer − late entrant*
Robinson and Fornell (1985)				
Consumer goods (n = 371)	29	17	12	17
Robinson (1988)				
Industrial goods (n = 1209)	29	21	15	14
Parry and Bass (1990)				
Concentrated industry				
Consumer goods (n = 437)	34	24	17	17
Industrial goods (n = 994)	33	26	20	13
Nonconcentrated industry				
Consumer goods (n = 156)	12	7	6	6
Industrial goods (n = 293)	14	10	8	6
Lambkin (1988)				
Start-up firms (n = 129)	24	10	10	14
Adolescent firms (n = 187)	33	19	13	20

study compares the ranks of market share leaders in 25 product categories in 1923 with their ranks in 1983 (see Table 2). Of these 25 leaders in 1923, 19 were still first, four were second, one was third, and one was among the top five in 1983.

Theories Against Pioneer Advantage

The literature suggests at least seven reasons why pioneers may be at a disadvantage, some of which have been better developed as theories. Lieberman and Montgomery (1988) review four factors: free-rider effects, shifts in technology, shifts in customer needs, and incumbent inertia. Additionally, improper positioning, changing resource requirements, and insufficient investments may prevent the pioneer from capturing market leadership. We briefly review each of these factors.

First, free-rider effects are present when a late entrant can acquire the same technology at a lower cost. Fershtman, Mahajan, and Muller (1990) show that under some conditions, final market shares do not depend on order of entry because of information diffusion among firms. Similarly, a late entrant can also acquire more productive labor than the pioneer (Guasch and Weiss 1980). Second, good opportunities for successful late entry occur with technological discontinuities (Yip 1982). Late entrants can capture market leadership by implementing superior technology to produce a better or cheaper product before the pioneer. Third, shifts in consumers' tastes also provide opportunities for late entrants better positioned for such shifts than pioneers. For instance, since the mid-1800s, new leaders have emerged in the soft drink category as the preferred flavor has changed from lemon to ginger ale to cola. Fourth, incumbent inertia may deter a pioneer from making the investments necessary to remain a market leader. Such inertia may be profit-maximizing for a pioneer if the return on investment from market leadership is below that available elsewhere. In this case, the best strategy for a pioneer is to steadily harvest market share (Lieberman and Montgomery 1988).

Fifth, late entrants may gain an advantage by positioning at the "ideal point" in attribute space if the pioneer has not done so and its costs of repositioning are high. Such a situation may occur if the ideal point becomes apparent only after the product is widely introduced. Sixth, pioneers may not have long-lived advantages if they are unable to adapt successfully to change. This situation occurs when the pioneer's competencies fail to meet the changes in demand, competitive threats, or the environment (Abell 1978). Seventh, pioneers may not be willing or able to commit the resources to succeed in new markets. For example, Chandler (1990) shows how the firm that commits resources for large-scale production, not necessarily the pioneer, tends to lead the market.

Table 2
MARKET SHARE RANK OF BRANDS: 1923 VS 1983 AS PUBLISHED IN *ADVERTISING AGE* (1983)

Brand	*1923 rank*	*1983 rank*
Swift's Premium bacon	1	1
Kellogg's corn flakes	1	3
Eastman Kodak cameras	1	1
Del Monte canned fruit	1	1
Hershey's chocolates	1	2
Crisco shortening	1	2
Carnation canned milk	1	1
Wrigley chewing gum	1	1
Nabisco biscuits	1	1
Eveready flashlight batteries	1	1
Gold Medal flour	1	1
Life Savers mint candies	1	1
Sherwin-Williams paint	1	1
Hammermill paper	1	1
Prince Albert pipe tobacco	1	1
Gillette razors	1	1
Singer sewing machines	1	1
Manhattan shirts	1	top 5
Coca-Cola soft drinks	1	1
Campbell's soup	1	1
Ivory soap	1	1
Lipton tea	1	1
Goodyear tires	1	1
Palmolive toilet soap	1	2
Colgate toothpaste	1	2

Evidence Against Pioneer Advantage

Scattered evidence, some of it indirect, may support some of the preceding theories. Some studies have not examined pioneer advantage specifically and others have not covered a broad cross section of goods. Therefore, the findings can be considered only suggestive of a pioneer disadvantage.

Glazer (1985) examined newspapers in Iowa from 1836 to 1976. He found that in successful markets, first entrants survived longer than second entrants, but in all markets first entrants survived as long as second entrants. Another study examining 100 successes and 100 failures found that the advantages of being "first-in" were almost equally balanced by the many pitfalls and disadvantages (Cooper 1979). In a convenience sample of French industrial products, Lilien and Yoon (1990) found lower market shares for first and second entrants and higher market shares for third and fourth entrants. A case study found six markets in which pioneers were successful and six markets in which pioneers were unsuccessful (Schnaars 1986). Another study found that late entry by brand extensions was successful (Sullivan 1991). Finally, using PIMS data, Moore, Boulding, and Goodstein (1991) questioned some conclusions about the effect of pioneering on market share by treating pioneering as endogenous rather than exogenous. Similarly, using reverse regression, Van Honacker and Day (1987) suggest that pioneer market share advantages may result from superior performance rather than time of entry.

Summary

The preceding review describes several theories for and against pioneer advantage. However, the empirical evi-

dence strongly favors a pioneer advantage. Studies that specifically examine order-of-entry effects all support some pioneer advantage. In particular, they show that pioneers are more likely than late entrants to (1) have high market share, (2) succeed, or (3) be market leaders in their product categories.

However, as explained previously, these studies have three limitations that may qualify their conclusions: (1) a bias toward studying only surviving firms, (2) a single-informant's self-reported measure of order of market entry, and (3) the use of the PIMS definition of "one of the pioneers" to mean the pioneer or first entrant in a market. The source of these problems is the use of large cross-sectional databases (e.g., PIMS, ASSESSOR) that may not have been designed to study order-of-entry effects. Indeed, authors have specifically called for alternate methods to avoid these limitations. We adopt one such method for our study.

METHOD

Our study method is historical analysis, which we explain in terms of rationale, procedure, and sampling.

Rationale

Historical analysis is a method that is probably best suited to analyzing the rewards of order of market entry, especially because the records of nonsurvivors are sparse. It is a process of assembling, critically examining, and summarizing the records of the past (Gottschalk 1969). This method of inquiry has been used sparingly in business research, though most notably by Chandler (e.g., 1990). The records of the past used in our study are all publicly available, published sources of information.

The primary advantage of historical analysis is that it focuses on information collected at the time the new product category was emerging. The approach provides a *prospective* look at pioneering because information is based on records written as the product category developed. In contrast, surveys or interviews with current survivors may be considered *retrospective* because the respondents report on events that occurred decades or centuries previously. To do so, respondents rely on personal recall or the oral tradition of the firm being surveyed.

A second advantage of historical analysis is that it can use multiple narratives of neutral observers such as reporters, experts, and students of the market. In contrast, surveys tend to rely on self-reports of one or two informants in the firms being studied. Thus, the historical approach is more likely to collect data that are factual rather than interpretive.

Researchers have often called for historical analysis in marketing (Nevett 1991; Savitt 1980). The approach is particularly well suited for the chronological dimension in research on pioneering. On the basis of their literature review, Lieberman and Montgomery (1988) emphasize the need for new data for studying pioneering. Robinson and Fornell (1985) note that the static nature of their cross-sectional analysis precludes consideration of important events that occur over time. Aaker and Day (1986) found that the techniques of historians would provide useful insights and generalizations for the analysis of growth markets. Urban et al. (1986) suggest that historical data would be useful in research on pioneering.

Procedure

We sought information on 17 key variables in each product category: the firms classified as product pioneer, market pioneer, early leader, and current leader; parent company, date of market entry, and current market share of each firm in these four classifications; and duration of leadership of pioneers. We also recorded information on many other related variables, events, and firms.

The sources covered for our study are myriad and are of two types: periodicals and books. First, we collected usable information from 450 articles in 25 different periodicals, though several hundred more articles were examined. Two of the most helpful and commonly used periodicals were *Business Week* and *Advertising Age*. Second, we collected usable information from 125 books and examinied about 125 more. These books tend to document individual product categories and brands. Many were written by university professors and contain references to periodicals going back hundreds of years. One of the reasons for examining so many sources is to find articles written close to the time each event occurred. Another reason is to corroborate as many sources as possible.

Some degree of uncertainty is inherent in the historical method because the researcher may face evidence that is diverse, complicated, and sometimes contradictory (Nevett 1991). Therefore, we used four criteria in evaluating and accepting information (see Gottschalk 1969 for a primer).

1. Competence: Is the *informant able* to report correct information?
2. Objectivity: Is the *informant willing* to report correct information (i.e., no vested interest)?
3. Reliability: Is the *informant a trusted source* of accurate information?
4. Corroboration: Is there *confirmatory evidence* from a similar source?

The competence criterion is satisfied by relying on highly regarded sources that were written or based on information written at the time each firm made an important move in the product category. The objectivity criterion is satisfied by relying on sources of information that were written by disinterested third parties. The reliability criterion is satisfied by using information from sources that have been well respected for a long time. For example, the top five periodicals used in our study are *Advertising Age, Business Week, Consumer Reports, Dealerscope Merchandising,* and *Forbes*. The longevity and continued respect for these periodicals attest to their reliability. A list of all sources used in the study is available from the authors. The corroboration criterion is sat-

isfied by using information from multiple data sources for each product category.

As an illustration of the effectiveness of the method used in our study, consider the following quotations from *Financial World* about a company in the restaurant business:

—"World's biggest chain of highway restaurants" (May 20, 1964, p. 5).
—"Pioneer in restaurant franchising" (April 5, 1967, p. 6).
—"Most strongly entrenched factor and highest quality investment" (April 5, 1967, p. 6).
—"Most fabulous success story in restaurant chains" (September 8, 1965, p. 5).

These statements probably bring McDonald's to mind. Indeed, if written today they probably would be describing McDonald's. However, these statements were written in the 1960s and they refer not to McDonald's, but to Howard Johnson's restaurants. Because restaurant franchising was developing in the 1960s, information about this market was collected from publications written in the 1960s. Thus, the prospective approach of historical analysis can be more insightful and accurate than the retrospective approach of surveys or interviews conducted today.

Sampling

The data for our study come from three sequential samples containing a total of 50 product categories. Because the results of the first sample were surprising, we selected two more samples on entirely different principles to validate the findings. In addition, the different samples enable us to determine how sampling affects the results.

Sample 1 is a selective sample based on three criteria. First, the sample includes only consumer goods. Second, it covers only recent product categories because of the easier availability of information on them. Third, the sample contains both new product categories (e.g., microwave ovens) and extensions of existing product categories (e.g., light beer). We found 17 product categories satisfying these criteria.

Sample 2 consists of 12 categories from the 25 in the *Advertising Age* report of long-term leaders (see Table 2). These 12 were chosen because they are distinctive and new within recent history. The other 13 categories, which are too old for identification of the market pioneers, are analyzed separately in Table 3.

Sample 3 consists of seven product categories, each of which contains a widely acknowledged market pioneer such as Xerox and Polaroid. (Samples 1 and 2 also contain a few widely acknowledged pioneers such as Apple, Pampers, and Singer.)

Thus, by definition, sample 2 and especially sample 3 are more favorable to the null hypothesis that pioneers are successful.

RESULTS

Table 3 contains the main data obtained from extensive analysis of historical records. The product pioneer, market pioneer, current market leader, and year of entry are reported separately for samples 1, 2, and 3. Because of limited information on the 14 supplementary categories, we report only the long-lived market leader and pioneer or early entrant. Tables 4 through 6 summarize the performance of pioneers in terms of failure rate, market share, and market leadership for the 36 product categories in samples 1, 2, and 3. This section merely highlights the results reported in the tables and contrasts them to those of prior studies; we try to explain the differences in the discussion.

Failure Rate

By "failure" we mean the end of sales in the category under the brand name with which it entered. We use "success" and "survival" as antonyms for failure. Table 4 shows the failure rate of market pioneers to be 47%. This high failure rate is not due to old categories; note that the rate is similar for categories starting before and after World War II. In contrast, other researchers claim that the failure of market pioneers does not alter their findings or that no pioneers failed in the categories studied (Urban et al. 1986). Table 4 shows some differences in failure rates across classes. The failure rate is lower for sample 3 because that sample was chosen specifically to include only well-known pioneers. The failure rate is also more than twice as high for durable than for nondurable goods. This finding can be attributed to more technological change in durable goods categories. Overall, our finding of a 47% failure rate suggests that the survival bias could be a potential problem in past studies and should be considered in future work.

Market Share

Table 5 shows mean market share of pioneers to be 10%. For product categories starting after World War II, average market share of pioneers is only 7%. Market share is higher for nondurable goods, probably because of their lower failure rate. The market share of pioneers is much higher for sample 3, which contains some famous pioneers. Most important, our finding of an average market share of 10% for pioneers is substantially lower than the 30% market share found by several researchers from the PIMS data (Table 1) and also by Urban et al. (1986) from the ASSESSOR data. Indeed, even the market share advantage of about 15 percentage points for pioneers over late entrants in the PIMS data is higher than the mean market share of pioneers in our data. These figures run contrary to the prevalent belief of a dominant and long-lived market share reward for pioneers.

Market Leadership

In the rest of the article, we use the term "leader" alone for the market share leader. Table 6 shows that the

Table 3
CHARACTERISTICS OF SAMPLES 1 THROUGH 3 AND SUPPLEMENTARY CATEGORIES
(date of firm's market entry in parentheses)

Category	Product pioneer	Market pioneer	Current leader
Sample 1			
1. Video recorders	Ampex (1956)	Ampex (1963)	RCA/Matsushita (1977)
2. Microwave ovens	Raytheon (1946)	Amana (1966)	GE/Samsung (1979)
3. Dishwasher	Crescent Washing Machine Co. (1900)	Crescent Washing Machine Co. (1900)	GE (1935)
4. Laundry dryers	Canton clothes dryer (1925)	Canton clothes dryer (1925)	Whirlpool (1950)
5. Facsimile machines	Xerox (1964)	Xerox (1964)	Sharp (1982)
6. Personal computer	MITS (1975)	MITS (1975)	IBM (1981)
7. Camcorder	Sony, JVC (1982)	Kodak/Matsushita (1984)	RCA/Matsushita (1985)
8. Color TV set	Bell Labs (1929)	RCA (1954)	RCA/Thomson (1954)
9. Wine cooler	California Cooler (1979)	California Cooler (1981)	Seagram, Bartles & Jaymes (1984)
10. Laundry detergent	Reychler (1913)	Dreft (1933)	Tide (1946)
11. Disposable diapers	Chux (1950)	Chux (1950)	P&G/Pampers and Luvs (1961)
12. Frozen dinners	Swanson (1946)	Swanson (1946)	Stouffer (1956)
13. Liquid dishwashing detergent	Liquid Lux (1948)	Liquid Lux (1948)	Ivory Liquid (1957)
14. Light beer	Trommer's Red Letter (1961)	Trommer's Red Letter (1961)	Miller Lite (1975)
15. Diet cola	Kirsch's No-cal cola (1952)	Kirsch's No-cal cola (1952)	Diet Coke (1982)
16. Liquid laundry detergent	Wisk (1956)	Wisk (1956)	Liquid Tide (1984)
17. Dandruff shampoo	Fitch's (1919)	Fitch's (1919)	Head & Shoulders (1961)
Sample 2			
18. Cereal	Granula (1863)	Granula (1863)	Kellogg (1906)
19. Cameras	Daguerrotype (1839)	Daguerrotype (1839)	Kodak (1888)
20. Canned fruit	Libby, McNeill, Libby (1868)	Libby, McNeill, Libby (1868)	Del Monte (1891)
21. Chocolate	Whitman's (1842)	Whitman's (1842)	Hershey (1903)
22. Vegetable shortening	Crisco (1911)	Crisco (1911)	Crisco (1911)
23. Canned milk	Borden (1856)	Borden (1860)	Carnation (1899)
24. Chewing gum	Black Jack/ American Chicle (1871)	Black Jack/ American Chicle (1871)	Wrigley (1892)
25. Flashlight batteries	Bright Star (1909)	Bright Star (1909)	Eveready (1920)
26. Safety razors	Star (1876)	Star (1876)	Gillette (1903)
27. Sewing machine	Elias Howe (1842)	4 firms (1849)	Singer (1851)
28. Soft drinks	Vernors (1866)	Vernors (1866)	Coca-Cola (1886)
29. Tires	Hartford Rubber Works (1895)	Hartford Rubber Works (1895)	Goodyear (1898)

Table 3 (Continued)

Category	Product pioneer	Market pioneer	Current leader
Sample 3			
30. Copy machines	3M Thermofax (1950)	3M Thermofax (1950)	Xerox (1959)
31. Telephone	Ries (1865) Gray (1876) Bell (1876)	Bell (1877)	AT&T (Bell) (1877)
32. Instant photography	Archer (1853)	Dubroni (1864)	Polaroid (1947)
33. Cola	Coca-Cola (1886)	Coca-Cola (1886)	Coca-Cola (1886)
34. Video games	Magnovox Odyssey (1973)	Magnovox Odyssey (1973)	Nintendo (1985)
35. Rubber	Goodrich (1869)	Goodrich (1869)	Goodyear (1898)
36. Personal stereo	Panasonic (1970)	Panasonic (1970)	Sony (1979)

Supplementary Categories	*Long-lived market leader*	*Pioneer/early entrant*
37. Bacon	Swift (1887)	Largest hog packers sold from Cincinnati prior to Civil War; Armour largest in Chicago in 1870s
38. Crackers	Nabisco (1890s)	Cracker bakery in Massachusetts in 1792; first brand to become No. 1 for Nabisco was Uneeda, and Ritz later became No. 1
39. Flour	Gold Medal (1880)	Largest flour mills in New York City and Chesapeake Bay area in 1700s
40. Mint candy	Life Savers (1913)	Large-scale U.S. production from mid-1800s
41. Paint	Sherwin Williams (1870)	Paints have been sold for hundreds of years
42. Paper	Hammermill (1898)	Rittenhouse Mill in Philadelphia in 1690
43. Pipe tobacco	Prince Albert (1907)	Bull Durham, Lone Jack, and Killickinnick brands since 1860s
44. Shirts	Manhattan (1857)	Ready-made clothing in U.S. since late 1700s
45. Soup	Campbell (1897)	Soup dates back hundreds of years; Campbell dominated market with condensed soups
46. Soap	Ivory (1879)	Soap dates back hundreds of years; Pears since 1789; Colgate Cashmere Bouquet since 1872
47. Tea	Lipton (1893)	Sold in Boston by two dealers in 1690; forerunner of Great Atlantic and Pacific Tea Co. (A&P) formed in 1859
48. Toothpaste	Crest (1955)	Colgate dominated market before P&G entered with Gleem (1952) and Crest
49. Beer	Annheuser-Busch (1852)	Brewery in North America in 1637
50. Toilet tissue	Scott (1890)	First sold by Joseph Gayetty in 1857; Charmin (1957) is current leader

market pioneers are current leaders in only 11% of the 36 categories. The rate is much lower after World War II and much higher for sample 3 because of the famous pioneers. Our finding of an average of 11% of pioneers being leaders contrasts with PIMS data, which indicate that almost half of pioneers are market leaders (Buzzell and Gale 1987).

Table 4
FAILURE RATE OF PIONEERS

Class	No. of failures	No. of cases	Failure rate (%)
Total	17	36	47
Pre-WW II	10	20	50
Post-WW II	7	16	44
Durable goods	12	18	67
Nondurable goods	5	18	28
Sample 1	9	17	53
Sample 2	6	12	50
Sample 3	2	7	29

Duration of Leadership

Market pioneers are *de facto* market leaders upon entry. In most product categories, however, this leadership does not appear to last very long. We analyzed the 16 post-World War II product categories because pertinent information was available for them. In this group, market pioneers maintained market leadership for an average of 12 years. However, the median period of leadership is only five years. A few product categories made the average much higher than the median. The lower figure is more representative of the typical period of leadership because the mode is also five years. This short period of leadership is even less attractive when we consider

Table 5
MARKET SHARE OF PIONEERS (1990)

Class	Mean market share (%)	No. of cases
Total	10	36
Pre-WW II	13	20
Post-WW II	7	16
Durable goods	7	18
Nondurable goods	13	18
Sample 1	6	17
Sample 2	10	12
Sample 3	21	7

that the product category often has not achieved significant sales levels in the initial years of leadership.

Nature of Leadership

The proposition of a long-lived market share leadership for pioneers is supported in only four of the 50 product categories studied. However, detailed analysis of these four categories shows that attributing current market position to market pioneering can be supported unambiguously in only one instance, Crisco shortening. In the other three categories the effect of being first in the market is less clear. For instance, Coca-Cola "entered the market as one of thousands of exotic medicinal products belonging to the nationwide patent medicine industry" (Louis and Yazijian 1980, p. 14). Coca-Cola originally contained two stimulants, kola nut extract with caffeine and coca leaves with cocaine. These addictive ingredients probably contributed as much to repeat purchase behavior as any other factor posited by theories supporting a pioneer advantage. In color television sets, RCA still has the highest market share but General Electric sold its color TV set business to Thomson Electronics of France because it was not profitable enough. Finally, in the telephone product category, Bell was able to dominate the market only after reaching a settlement with Western Union for patent infringement. This settlement called for Bell to pay 20% of its revenues to Western Union for 17 years.

Table 6
LEADERSHIP OF PIONEERS

Class	No. of leaders	No. of cases	Percentage of leaders
Total	4	36	11
Pre-WW II	3	20	15
Post-WW II	1	16	6
Durable goods	2	18	11
Nondurable goods	2	18	11
Sample 1	1	17	6
Sample 2	1	12	8
Sample 3	2	7	29

In all of the other 46 categories, the pioneers either failed or are not leaders, or leaders were incorrectly classified as pioneers. This conclusion may seem surprising, but an example demonstrates the insights provided by our research method. Most people think of Xerox as the pioneer in copying machines, but consider the following quotation from an article about Xerox's entry into copying (*Business Week*, September 19, 1959, p. 86).

> Office copying is a field where Haloid (Xerox) will find plenty of competition. Most of the 30 or so copying machine manufacturers are already in it with a variety of products and processes—including such strong competition as Minnesota Mining & Mfg. Co. (Thermo-fax), Eastman Kodak (Verifax), and American Photocopy Equipment Co. (Apeco).

DISCUSSION

We first explain our results in comparison with the findings of previous research, then report some results about "early leaders" and cite some important limitations and directions for future research.

Comparison With Previous Research

Our findings indicate that the rewards of pioneering are less than those found in previous research. The difference may be due to three important factors: (1) the sampling of nonsurvivors, (2) the operational definition of the pioneer, and (3) the historical method. A consideration of these factors suggests that our results complement rather than contradict past findings.

First, a key difference between our study and prior studies is our sampling of all firms, both survivors and nonsurvivors. By so doing, we found a failure rate of 47% for pioneers, which is closer to the failure rate of 33 to 35% found in the Booz, Allen & Hamilton (1982) study of new products. The substantially lower market share of pioneers (10%) we found is due partially to the high number of failed market pioneers with an effective market share of zero. To determine the effect of failed pioneers, we calculated the average market share of only surviving pioneers and found it to be 19%. This figure is closer to the approximately 30% market share found by Robinson and Fornell (1985) and Urban et al. (1986). Other factors such as definition and measurement may contribute to the remaining 11-percentage-point difference in mean market share.

Second, our *operational* definition of pioneer is different from that used in previous studies (even though the conceptual definition is the same). We operationalized pioneer as the first entrant, Urban et al. (1986) operationalized pioneer as the earliest surviving brand in the ASSESSOR database, and Robinson and Fornell (1985) operationalized pioneer as "one of the pioneers . . . " among current survivors (the PIMS measure). As a result, our study addresses the success of first entrants whereas the other two studies address the effects of order of entry among survivors. However, these two databases

may not include all surviving brands in a category. Hence, the two approaches address slightly different though important aspects of pioneering. One may even suggest a nonlinear relationship from these studies: first entrants and late entrants do not fare as well as early (surviving) entrants.

Third, the identification of pioneers is a potential problem in some prior studies. For example, Urban et al. (1986) identify Miller Lite as the first entrant in light beer whereas Carpenter and Nakamoto (1989) point out that Miller Lite was not the first entrant. We found that Trommer's Red Letter was the pioneer and entered 14 years before Miller Lite. We were unable to ascertain completely the extent of misidentification because of the proprietary nature of the PIMS and ASSESSOR data. Misidentification is probably due to reliance on self-reports instead of a thorough historical analysis of each product category.

For example, many people consider Goodyear (instead of Goodrich) to be the pioneer in rubber and tires because Charles Goodyear discovered the process for vulcanizing rubber. However, the Goodyear company bearing his name was founded decades after his death and decades after the entry of Goodrich. More recently, Apple Computer has been considered the pioneer in personal computers. The popular press perpetuates this image and Apple's advertising builds on this belief. However, closer analysis indicates that Apple was preceded by MITS and entered the personal computer market along with dozens of other personal computer companies (Freiberger and Swaine 1984).

Thus, self-reports may be unreliable. As time passes and history fades, a respondent within a successful and dominant firm may consider it to be one of the pioneers, if not *the* pioneer. Time clouds the facts and success feeds the legend. We suspect that some surveys may have wrongly identified the early leader as the pioneer. To pursue this hypothesis, we analyzed the performance of early leaders.

Early Leaders

We define the early leader as the firm that is the market share leader during the early growth phase of the product life cycle. Table 7 indicates the performance of these firms. Note that early leaders are currently leaders in more than half of the product categories studied and have very low failure rates (8%). Most interestingly, their market share of 28% is very close to that obtained for market pioneers in PIMS and ASSESSOR data. Such similarities lead one to suspect that self-report surveys or inconsistent definitions may wrongly classify early leaders as pioneers. The success, leadership, and stability of early leaders may also explain the persistent market share stability indicated in the *Advertising Age* report (Table 2).

How close are early leaders to pioneers? We find that early leaders enter product categories many years after the market pioneer. In the product categories studied, early leaders entered 13 years after market pioneers. The time lag was 19 years in pre-World War II product categories and five years in post-World War II categories. Similarly, current leaders entered 20 years after market pioneers. The time lag was 26 years in pre-World War II categories and 11 years in post-World War II categories. These time lags are not trivial. In the quest to enter and dominate markets, firms time their entry very carefully, often striving to be first by months or a few years. Hence, these early leaders should not be classified as pioneers.

Table 7
CHARACTERISTICS OF EARLY MARKET LEADERS

Class	*Failure rate (%)*	*Market share (%)*	*Percentage of leaders*	*No. of cases*
Total	8	28	53	36
Pre-WW II	10	35	60	20
Post-WW II	6	20	44	16
Durable goods	11	30	61	18
Nondurable goods	6	26	44	18
Sample 1	6	21	47	17
Sample 2	8	30	50	12
Sample 3	14	42	71	7

Why are early leaders so successful? The reason may be their ability to spot a market opportunity and their willingness to commit large resources to develop the market. Indeed, in many of the categories we studied, the start of the growth phase in the product life cycle may well be attributed to the market-building efforts of these early leaders. Our finding is similar to Chandler's (1990) for industrial goods, where long-term survival and success were due more to the commitment of adequate resources to large-scale production than to entering first.

Limitations

Our study has several limitations that future research should address. Most important, the study does not consider the impact of the marketing mix (e.g., advertising, price, promotion, product quality, distribution) and managerial effectiveness. These variables may explain why some pioneers have succeeded while others have failed. Separation of these effects would reveal the true rewards of pioneering, if any. However, it is interesting to note that inclusion of additional variables in Urban's model reduces the order-of-entry penalty: " . . . order effect parameter is −0.61 when it is the only independent variable, −0.53 when the positioning variable is added, −0.43 when the advertising variable also is appended, and −0.48 with all the variables" (Urban et al. 1986, p. 651). Similarly, Robinson and Fornell's (1985, p. 310) descriptive statistics indicate that pioneers have 29% market share. However, after inclusion of several additional variables such as relative product quality, relative price, number of competitors, and relative advertising and promotion,

the effect of pioneering on market share is actually negative (though not significant; p. 312). Historical research may be necessary to determine the true pioneer, but scanner panel data may be able to separate the effects of order of entry from those of marketing mix.

Another limitation is our use of a customer-oriented definition of product category. Though that definition is always arbitrary (Day, Shocker, and Srivastava 1979), Table 3 reveals that our product categories are all plausible. We have chosen to identify pioneers in distinctive product categories rather than in narrow subcategories. We believe this approach is necessary, as otherwise the theory of pioneer advantage would not be falsifiable—the leader of each subcategory could be considered its pioneer. Also, note that the rewards of pioneering are not any stronger in the lower level categories we considered (numbers 13 through 17 in Table 3). However, because the identification of pioneers is contingent on determining product categories, an interesting direction for future research would be to incorporate work on product categorization (e.g., Loken and Ward 1990; Ratneshwar and Shocker 1991; Sujan and Bettman 1989). Future research could also consider issues relating to continuous and discontinuous innovation. There may be instances in which a new technology is sufficiently improved that a new category is formed. Pioneers that continue with the old technology may not be as successful as pioneers that adopt the new technology. Determining an appropriate method for categorizing product-markets over time may help to resolve the discrepancies between our findings and those of previous studies.

One may wonder to what extent category selection drives the results. Concern about this issue led us to draw three sequential samples. Whereas sample 1 was chosen on certain objective criteria, samples 2 and 3 are increasingly biased in favor of finding a pioneer advantage. Sample 2 is from the *Advertising Age* report, which was based on a select 25 categories exhibiting long-term share stability. Sample 3 consists of well-known pioneers. A comparison of results across samples in Tables 4 through 6 shows that the results are certainly not due to choosing categories unfavorable to pioneers. Moreover, if all 50 categories had been selected randomly, the results may have been more unfavorable to pioneers. Similarly, the exclusion of the 14 old categories (Table 3) from sample 2 biases the results in favor of finding successful pioneers because the market pioneers have probably failed in these 14 categories. In addition, we chose only well-established categories. The costs and risks of pioneering unsuccessful product categories are likely to be even higher. Future research could extend this work to other categories and explore differences across categories.

Another question is how sensitive even these results are to survival bias. Actually, we cannot be certain that a survival bias is not still present in these data. For example, some other firms may well have entered the market before the firm we identified as the market pioneer. However, such other firms are more likely to have failed than to have succeeded, because a surviving pioneer would very likely have publicized that fact and early commentators would have noted it. Hence, a potential bias, if any, would underscore the findings because it would lead to the discovery of more unsuccessful market pioneers with 0% market share. An additional potential limitation of our study is that some of the data could be incorrect because historical records are not 100% accurate. However, our use of corroborating evidence wherever possible mitigates this concern. Also, because of the large number of categories and the fairly consistent findings across subcategories and classes, a few errors would not alter the main conclusions. In addition, we performed a sensitivity analysis using syndicated data from Simmons Market Research Bureau. The main results presented here are robust to this alternate source of data (Golder and Tellis 1992).

Finally, classifying pioneers as failures on the basis of market exit may produce some bias. For example, some discontinued brands might have become successful if an alternative marketing approach had been applied. Alternatively, some brands may remain on the market too long, causing "failure" to be recorded later than it should be. Understanding and clarifying these issues is another area for future research.

If pioneers do not have rewards as great as previously believed, what motivates firms to rush a product to market? The answer is probably expected profits. Even if the probability of long-term market dominance is small, the payoff when it occurs may be so large that it may more than compensate for the risks. In addition, by definition all pioneers have the opportunity to collect monopoly profits for some period. Our entire analysis focuses on market share, not profits (similar to most other research on pioneering). Market pioneers that failed may very well have realized a good return on investment or achieved their profit goals. Also, surviving market pioneers with low market share could still be profitable. The issue of financial rewards to pioneers is an important area for future research. Similarly, a financial analysis of the profitability of market leaders is also important.

CONCLUSIONS AND IMPLICATIONS

Though several studies show that market pioneers have some long-term advantages, their findings are qualified by problems of survival bias, imprecise definition of the pioneer, and self-reports of single informants from the sampled firms. We use a historical analysis of 50 categories to assess the rewards of pioneering while avoiding these limitations. Our main results, subject to the limitations of our study, follow.

1. The mean market share of pioneers is 10%, much lower than the 30% from the PIMS and ASSESSOR data. Our analysis shows that about half of this difference is due to our sampling both survivors and nonsurvivors, and the rest is probably due to our identification of pioneers through historical records (rather than by survey).

2. Forty-seven percent of market pioneers fail. In comparison, other researchers have found no pioneers that failed, or have not considered the survival problem to be serious.
3. Eleven percent of pioneers are current market leaders. In comparison, PIMS data indicate that almost half of pioneers are market leaders.
4. Our results about market pioneers are in spite of our sampling categories that are more favorable to pioneers. The results are not very sensitive to the age of the category. Indeed, pioneers are market leaders usually for only 5 to 10 years. The rewards of pioneering are stronger for nondurable goods.
5. Early market leaders that have a higher market share, success rate, and market leadership than pioneers enter markets about 13 years after the market pioneers.

Our findings have three important implications, but they should be viewed cautiously because past success or failure does not automatically imply future outcomes. First, the findings underscore the need for carefully researching the problem of pioneering, preferably with extensive historical analysis. Second, they suggest the importance of continuous innovation within the product category. This approach enabled many later entrants to become successful and may help pioneers defend against new entrants. For example, Gillette has maintained leadership in the safety razor market by constantly innovating even at the cost of cannibalizing its older brands.

Third, our results suggest that being first in a new market may not confer automatic long-term rewards. An alternative strategy worth considering may be to let other firms pioneer and explore markets, and enter after learning more about the structure and dynamics of the market. Indeed, early leaders who entered an average of 13 years after the pioneer are more likely than pioneers to lead markets today. The reason is that the early leaders entered decisively and committed large resources to building and leading the market. An example by Lieberman and Montgomery (1988) underscores this point. Matsushita's nickname, *maneshita denki* (meaning "electronics that have been copied") reflects its strategy. The company generally lets Sony innovate and then takes a position based on manufacturing and marketing skills.

Actually, markets evolve over a number of years, new technologies emerge, and leading companies occasionally make mistakes. The logic of success is not to be first to enter the market, but to strive for leadership by scanning opportunities, building on strengths, and committing resources to serve consumers effectively. The evolution of products repeatedly shows that each firm that was not able or willing to commit the resources necessary for market leadership was passed by another firm that was able and willing. This trend has happened throughout history and it will continue.

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