Review of Industrial Organization **9**: 1–23, 1994
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First-Mover Advantages from Pioneering New Markets: A Survey of Empirical Evidence

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Abstract. Market pioneers can develop first-mover advantages that span decades. The most general first-mover advantage that helps explain higher pioneer market share levels is a broad product line or brand proliferation. In markets for experience goods, pioneers tend to shape consumer tastes and preferences in favor of the pioneering brand. While the preliminary results vary by industry, they indicate that market pioneers do *not* tend to perish more often than later entrants. Accounting profits for market pioneers generally are lower in the first four years of operation, but higher thereafter. Overall, market pioneers follow innovative strategies that have high initial costs and risks, but yield high potential returns.

Key words: First-mover advantages, market share, market pioneers.

I. Introduction

Being the market's first entrant is generally more costly than being an early follower or a late entrant. The reason is that product innovation tends to be more costly than product imitation (Mansfield, Schwartz and Wagner, 1981; Levin *et al.*, 1987). Will the first entrant's higher costs be offset by revenue gains? If so, innovation is encouraged, which is a key source of economic growth.

Though the empirical evidence in economics generally supports first-entrant revenue gains, it is based on a few industries, such as pharmaceuticals (Bond and Lean, 1977; Gorecki, 1986; Hurwitz and Caves, 1988; Grabowski and Vernon, 1992) and cigarettes (Whitten, 1979). More extensive empirical work on first-mover advantages comes from research in business schools.

We survey empirical evidence of first-mover advantages from pioneering new markets. (Also, see Scherer and Ross, 1990, pp. 582–592.) One key research stream examines the impact of order of market entry on market share. The survey

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results consistently show that market pioneers tend to maintain market share advantages over later entrants. For example, across broad samples of business units, Robinson and Fornell (1985) and Robinson (1988a) estimate the empirical association between order of market entry and market share. It is almost as strong as the empirical association between market share and profitability (Shepherd, 1972; Ravenscraft, 1983). Note that Schmalensee (1989) classifies the association between market share and profitability as one of "the main empirical regularities that have been uncovered in inter-industry research" (p. 953). These two general tendencies suggest that market pioneers also tend to have higher profitability.

How have so many pioneers maintained market share advantages for literally decades? We address this question as well as several others:

- How is a market pioneer identified?
- Can the market pioneer shape consumer tastes and preferences?
- Are market pioneer advantages often sustained by crushing later entrants with aggressive reactions?
- Do market pioneers typically start with superior skills and resources?
- How long does it take later entrants to reach their long-term (asymptotic) share level?
- How important is the pioneer's leadtime in developing sustainable market share advantages?
- Do market pioneers have higher accounting profits than later entrants?

These questions are typically addressed by examining surviving market pioneers and later entrants. Such research provides insights into the rewards for market pioneering, conditional on survival. Because market pioneering is both costly and risky, the survival issue is also examined. Finally, public policy implications are addressed.

II. Identifying the Market Pioneer

A fundamental consideration is how to identify the market pioneer. Though various definitions have been proposed (Lieberman and Montgomery, 1988), the market pioneer is typically defined as "the market's first entrant." Implementing this definition requires that (1) entrants be distinguished from firms that attempt to enter a new market, but fail and (2) market boundaries be established.

To be classified as an entrant, a business should reach a competitive scale of commercialization. A competitive scale gives the market pioneer an opportunity to capture first-mover advantages. If competitive scale is not reached, a firm should be classified as having failed in its attempt to enter a new market. For example, Whitten (1979) requires that an entrant in a national cigarette market be supported by national advertising. Urban *et al.* (1986) require that an entrant in a national market for consumer packaged goods achieve national distribution. Hence, if a firm does not have national advertising or national distribution in a national market, it does not qualify as an entrant.

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At what point in the market's evolution should market boundaries be determined? Market boundaries are typically determined after customer acceptance for a new product has been established. The reason is that it is very difficult to assess the commercial potential of a dramatic innovation at the time of its introduction. For example, when Xerox entered the photocopying market in 1958, the commercial potential for plain-paper copying was not recognized (*Washington Post*, 1985). Even industry experts did not foresee plain-paper copying as a new market, but it turned out to be one because it generated many more photocopying applications. Plain-paper and coated-paper copying were different markets because they were not viewed by customers as close substitutes. That fact could not be determined in 1958 however, and Xerox was not immediately recognized as the market pioneer.

Once customer acceptance has been established, how should market boundaries be determined? Market boundaries typically reflect customer substitution in use. In practice, they have been based on accepted industry practice (Whitten, 1979), consumer evaluations of products that are close substitutes (Urban *et al.*, 1986), and managers' evaluations of their company's target customers (*PIMS Data Manual*, 1979). As a whole, these market boundaries tend to be narrower than four-digit SIC codes. The general insights into market pioneer advantages described below are robust to these varied definitions of market boundaries.

In contrast, Golder and Tellis (1993) identify market pioneers using historical analysis. This innovative approach relies on objective information from multiple sources at the time the market originated, thus avoiding reliance on industry representatives to identify the market pioneer many years after the market's beginning. Though industry representatives are experts, Golder and Tellis argue their response is often based on personal recall or on the firm's oral tradition. As a result, high market share firms can be misidentified as market pioneers. The main strength of historical analysis is that it overcomes this problem.

One weakness of historical analysis is that it can miss the start of new markets that are based on dramatic innovations. For example, Golder and Tellis identify Xerox as a later entrant, not as a market pioneer. Also, historical analysis requires a great amount of time to implement. After gathering usable information from more than 450 articles, Golder and Tellis present detailed insights on only 36 markets.

Table I highlights the importance of these market pioneer definition issues. Across Golder and Tellis' 36 markets, only four market pioneers remain the current market leaders. Note that Golder and Tellis do *not* require the pioneer to reach a competitive scale of commercialization. Hence, their definition can identify a very low market share firm as a market pioneer. For example, Golder and Tellis identify Trommer's Red Letter as the market pioneer of light beers. Trommer's was introduced by Piels Brewing Company of Brooklyn New York and was only on the market for about six weeks. Prior to Miller Lite, Trommer's and other brewers of diet beers were described as "an aberration in the minds of floundering, small-time brewers" (*Marketing and Media Decisions*, 1983). By more conven-

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Table I. Alternative market pioneer definitions (firm's market entry year in parentheses)

Golder and Tellis Definitions			More Conventional Definitions		
Market	Market pioneer	Current leader	Market	Market pioneer	Comments
Light Beer	Trommer's Red Letter (1961)	Miller Lite (1975)	Light Beer	Miller Lite (1975)	Trommer's Red Letter was manufactured by a small, local brewer and was taken off the market after about six weeks. Miller Lite was the first nationally distributed light beer (*Marketing and Media Decisions* 1983).
Disposable diapers	Chux (1950)	P&G/Pampers & Luvs (1960)	Disposable diapers for home use	P&G/Pampers & Luvs (1966)	Because of a high price and a crude design, Chux was primarily used during travel. National distribution of Pampers, designed and priced for home use, started in 1966 (Porter 1983).
Cameras	Daguerrotype (1839)	Kodak (1888)	Cameras for amateurs	Kodak (1888)	The Daguerrotype was a large, bulky camera used primarily by professionals. The Kodak No. I was a handheld box. It was the first camera designed and sold primarily for amateur use (*Chicago Tribune* 1989).
Chocolate	Whitman's (1842)	Hershey (1903)	Chocolate bars	Hershey (1903)	Whitman's chocolate was sold in blocks of one pound or larger. Hershey's chocolate bars were the first to be mass marketed for individual servings (Cleary 1981). Because chocolate bars and blocks of chocolate are not close substitutes, these are different markets.
Copy machines	3m Thermofax (1950)	Xerox (1959)	Copy machines using plain paper	Xerox (1959)	Prior to Xerox, coated-paper copies were a nuisance and cost 19 to 25 cents each. The Xerox 914 plain-paper copier was leased at an average cost of roughly 5 cents per page. Xerox's lower price and higher quality opened up a "vast, unsuspected market" (*Washington Post* 1985).
Instant photography	Dubroni (1864)	Polaroid (1947)	Instant photography	Polaroid (1947)	Though references to Dubroni could not be found, the Dubroni would not be viewed by consumers as a close substitute for the Polaroid Land Camera Model 95. By modern standards, Polaroid was the first instant camera (*Reuter Library Report* 1988).
Safety razors	Star (1876)	Gillette (1903)	Safety razors	Gillette (1903)	References to Star could not be found, but Gillette is widely recognized for inventing and marketing the safety razor on a national scale (Cleary 1981).
Sewing machines	4 Firms (1849)	Singer (1851)	Sewing machines for home use	Singer (1851)	Though Singer did not invent the sewing machine, he made the first sewing machine that could easily be used by a homemaker and was the first to mass produce sewing machines (Cleary 1981).

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tional definitions, Miller Lite and seven other current market leaders in Table I are classified as market pioneers. This increases the total number of pioneers that are current market leaders from four to 12.

In summary, historical analysis helps avoid the problem of high market share firms being misidentified as market pioneers. Though time consuming, historical analysis in conjunction with current industry insights should yield the most accurate market pioneer definitions. Either approach used in isolation can generate misleading results.

III. Industry Studies

The pharmaceutical industry has received the most attention. Bond and Lean (1977) analyzed two United States ethical drug markets. After more than 10 years in the market, both first entrants maintained market share leadership. Hurwitz and Caves (1988) examined market share levels for 29 original patent holders in United States pharmaceutical markets. At varying numbers of years after patent expiration, average pioneer market share was 63%. Two years after patent expiration, the average pioneer market share was 51%. These results point to powerful first-mover advantages in the United States pharmaceutical industry. Gorecki (1986) provides similar conclusions for the Canadian pharmaceutical industry.

What was the main first-mover advantage? Bond and Lean conclude the main advantage was physician preference for the established and familiar pioneering brand names. Because patent protection has numerous limitations, "trademark protection . . . appears to be far more powerful than patent protection" (p. 77).

Market share leadership was *not* driven by the pioneer's superior product quality or lower prices. For example, though quality differences can arise across ethical drugs, the first movers in Hurwitz and Caves' sample all faced generic substitutes. Even so, these first movers charged an average price premium of 127%. Hurwitz and Caves estimate that "a 10 percent increase in the leader's price premium loses it only three- to four-tenths of a percentage point of market share" (p. 314).[1]

Market share leadership does *not* appear to be driven by promotional spending. Bond and Lean conclude (p. vi), "the data appear to reveal that sales and promotional dominance go hand-in-hand. Nonetheless, the data also show that the opportunities for gaining sales via promotion are decidedly limited. Qualitative characteristics such as the timing of entry and therapeutic novelty appear to determine both the profit-maximizing level of promotion and the sales associated with that promotion". Though first-entrant promotional spending was relatively large, it was smaller than competitors' as a percentage of sales.

When facing strong first-mover advantages, what can a later entrant do to build market share? Bond and Lean say "physicians can be persuaded to prescribe late-entering brands if those brands offer some therapeutic gain useful to a subset of patients" (p. 76). For Canadian provinces, Gorecki recommends certifying brands as therapeutically equivalent and allowing pharmacists to select a lower priced

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