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Abstract

Many managers would like to have not only a dominant market position, but to maintain it over time as well. This empirical study examines various operating and first-mover advantages that help a firm maintain market dominance. When comparing dominant to nondominant firms, dominant firms tend to have operating advantages in terms of higher product quality and broader product lines. Because higher prices for dominant firms appear to reflect higher product quality, they do not help or hurt market dominance. Industries where first-mover advantages are relatively important, such as those with important manufacturing scale economies, favor market dominance. It is more difficult to maintain market dominance in industries that have frequent product changes and are relatively large.

Keywords: Competitive strategy, first-mover advantages, and dominant firms.

1. Introduction

Schmalensee (1987, p. 62) says, "A dominant firm in economic theory is generally a single large seller facing many small price taking rivals". In marketing strategy, key questions on dominant firms are, how can we get it? Once we have it, how can we maintain it? Public policy though takes a different perspective. For example, would society be better off if we got rid of certain dominant firms? Is so, how can this be handled without discouraging future innovation and risk-taking?

Economic research, such as The Economics of Market Dominance edited by Hay and Vickers (1987), provides insights into a number of these questions. In the marketing strategy literature, to the best of the author's knowledge, Carpenter and Nakamoto (1990) is the only paper that examines dominant firms. Their theoretical paper provides insights into how a later entrant can develop positioning, advertising, and pricing strategies to challenge a dominant firm. Because of the limited research in marketing strategy, this paper provides a brief overview of the economics literature on dominant firms.

This paper's main research contribution examines how a firm can maintain a dominant market position. Empirical research on dominant firms typically examines either a few industries (White 1983) or mergers at the turn of the century (Caves, Fortunato, and Ghemawat 1984). This empirical study uses a broad cross-section of the PIMS (Profit Impact of Market Strategy) data to compare dominant versus various types of nondominant firms. (The nondominant firms are typically in oligopolies, although some are in fragmented markets and a few are in markets dominated by another firm.) The empirical results yield insights into how market dominance is maintained.

The empirical results indicate that dominant firms tend to have higher product quality and broader product lines. While average prices are higher versus nondominant firms, the higher prices appear to reflect the higher product quality. Industries where first-mover advantages are relatively important tend to favor market dominance. For example, market dominance is favored as the importance of manufacturing scale economies increases. Dominance is more difficult to maintain 1) when products are changed over time, such as through customization rather than standardization and 2) more importantly, in relatively large markets.

2. Overview of Dominant Firms

Empirical definitions of market dominance as well as potential sources of market dominance are reviewed below. This is followed by hypotheses that address how a dominant position can be maintained.

Empirical Definitions of Dominant Firms

While Schmalensee's definition above provides theoretical guidance, how are dominant firms empirically identified? Empirical studies must distinguish a dominant firm from both a monopoly and an oligopoly. A monopoly only has a single large firm. It does not have many small price taking rivals. An oligopoly has two or more relatively large firms.

Empirical studies often use different definitions of dominant firms. Even so, Geroski (1987, p. 144) concludes "A market share of 40% is the conventionally accepted cut-off point". Scherer and Ross (1990) point to a single firm market share of 40% or more. Shepherd (1991) recommends a market share over 40%

with no close rivals. Overall, these definitions require at least a 40% market share and some definitions mention the market share levels versus other competitors. Based on these definitions, Table 1 provides eight examples of dominant firms.

In the data analysis below, the PIMS definition of a dominant firm requires a market share of at least 50%. The minimum market share is increased from 40% to 50% to reflect the fact that PIMS market boundaries tend to be narrower than those used in other studies. For example, they tend to be narrower than Table 1's four-digit SIC codes.

The PIMS definition also requires that the dominant firm's market share be at least twice the size of the next largest competitor. This distinguishes a dominant firm from an oligopolist. Thus, even it a firm has a market share of 60%, if the leading competitor has a market share of 35%, it would not be considered a dominant firm. Instead, it would be an oligopolist.

Sources of Market Dominance

How can a firm gain a position of market dominance? Vickers and Hay (1987) describe four options. Government can grant legal protection, from say a patent or regulation. Patent protection is typically important in a limited number of industries, such as chemicals and pharmaceuticals, and their effective life is often less than five years (Scherer and Ross 1990). Government regulation often yields a monopoly rather than a dominant firm. Thus, government grants probably account for only a small portion of dominant firms.

Mergers can yield a dominant market position. "Two great waves of merger activity during 1879-1893 and 1897-1903 brought together billions of dollars of assets within hundreds of United States industries" (Caves, Fortunato,

TABLE 1

Examples of Dominant Firms[a]

Market	Market Share	
	Dominant Firm	Second Largest
Canned Soup	Campbell's (53%)	Progresso (20%)
Chewing Gum	Wrigley (49%)	American Chicle (24%)
Refrigerated Cookie Dough	Pillsbury (76%)	Private Label (7%)
Baby Food	Gerber (71%)	Beech-Nut (14%)
Baby Powder	Johnson and Johnson (60%)	Private Label (19%)
Film	Eastman Kodak (64%+)	Polaroid (10%)
Glass and Toilet Bowl Cleaners	Windex (48%)	Glass Plus (18%)
Soaps and Detergents	Procter & Gamble (72%)	Colgate-Palmolive (17%)

a) The examples and market share levels are from the Market Share Reporter - 1995. Market boundaries are based on four-digit SIC codes.

and Ghemawat 1984, p. 530). Mergers though with the intent to dominate or monopolize a market have been illegal in the United States since the turn of the century[1]. For example, Microsoft recently dropped its bid to buy Intuit for $2.3 billion. The U.S. Justice Department alleged the merger "would give Microsoft total dominance over the burgeoning market for personal-finance software" (Wall Street Journal 1995, p. 1).

Predatory behavior that is designed to destroy existing competitors rather than serve customers can also yield a dominant position[2]. Predatory behavior is illegal in the United States and the most convincing examples arose at the turn of the century following the waves of merger activity (Scherer and Ross 1990). Thus, predatory behavior is probably not an important way to gain a dominant position.

The fourth option to gain market dominance is by competitive superiority over rivals. Schmalensee (1987, p. 71) says, "most dominant positions, particularly those created in the US after 'merger for monopoly' was ruled illegal in 1903, have their origins to an important extent in innovation, broadly defined." Thus, in recent decades, innovation is probably the most important way dominant firms have been formed.

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[1] There are some exceptions. For example, regulators allowed Ticketmaster to purchase its largest competitor, Ticketron, which was nearly bankrupt (BusinessWeek 1995).

[2] Predatory behavior that is designed to destroy new entrants would be a way to maintain rather than gain a dominant position.

3. Hypotheses to Maintain Market Dominance

Once a dominant position is achieved through innovation, how can it be protected from what Schumpeter calls a "swarm of imitators"? This is a key issue because dominant firm positions typically decline over time. For example, Caves, Fortunato, and Ghemawat (1984) conclude that roughly 40% of the dominant firm mergers at the turn of the century were outright failures. They also examine dominant firm positions in 1905 that survived to 1929. Even for these relatively successful cases, the mean market share declined from 69% in 1905 to 45% in 1929.

To maintain a dominant market position, a dominant firm must limit the entry of new rivals as well as the growth of existing rivals. To do this, Gaskins' (1971) theoretical model concludes the dominant firm must have some type of sustainable competitive advantage. Schmalensee (1987) reaches a similar conclusion. He says, "the power to exclude competition in the long run can only derive from long-run (i. e. long-lived) advantages over actual or potential rivals. The literature makes it clear that size does not by itself confer such advantages" (p. 64).

Even so, this does not mean that all dominant firms have sustainable competitive advantages. This is because a firm could be a declining dominant firm that was once great, or at least large, but is now slowly harvesting their market share. Consider the classic example of U.S. Steel Corporation described in Scherer and Ross (1990). U.S. Steel was formed by merger in 1901. They started with a 65% market share. Initially, they did not have lower costs than rivals. In later years, U.S. Steel even had higher costs than certain rivals. Over time, their market share declined to 42% in 1925 and to 24% in 1967. Thus, even without

lower costs, it took decades for U.S. Steel to lose their dominant market share position.

When a dominant firm has a sustainable competitive advantage, Schmalensee (1987) classifies it as being either an operating advantage or a first-mover advantage. He says "A firm with operating advantages has lower costs or more favorable demand conditions (perhaps because of superior products) than any potential entrant" (p. 64). Because operating advantages arise from superior skills or resources, they are business rather than industry characteristics. Examples include superior products or lower prices supported by lower costs. The lower costs though should be based on superior skills and resources and not on scale economies. As discussed below, scale economies can yield a first-mover advantage.

First-mover advantages arise because the dominant firm entered the market first. For example, Carpenter and Nakamoto (1989) show that consumer tastes and preferences can be shaped in favor of the pioneering brand. When consumers view the first brand as the industry standard, this yields a brand name advantage for the pioneer. Scale economies also favor the first-mover. When a later entrant can not achieve a similar scale of operations, their costs are not competitive.

Hypotheses for Operating Advantages

The potential operating advantages examined below are product quality, product line breadth, and price. Each measure is relative to the three leading competitors. While the economic theory for dominant firm operating advantages is not well developed, Schmalensee (1987) speculates that one advantage is from superior products.

Superior product quality could arise from superior skills and resources that helped the firm gain market dominance. Even though research such as Robinson, Fornell, and Sullivan (1992) does not report skill and resource superiority for market pioneers, who are likely candidates for market dominance, this type of research examines broad averages. Thus, even if the average market pioneer does not not have superior skills and resources, a few pioneers could excel relative to their competition.

An alternative hypothesis is that dominant firms do not tend to have superior product quality. Even if superior skills and resources helped a firm gain a dominant position, these competitive advantages could disappear over time. Also, White (1983) observes that some firms attempt to maintain their dominant position by quick imitation, which yields average rather than superior product quality.

Broad product lines should help a firm maintain a dominant market share. White's (1983) study of nine dominant firms illustrates the importance of product line extensions. She concludes, "The high technology firms use a stream of new products and a succession of product changes. Branded, consumer products firms also introduce new products, but they are more often of the form of new brands or varieties" (p. 122). Thus, even if line extensions are not very innovative, a broad product line that satisfies different customer needs and wants should help maintain market dominance.

Holding product quality constant, it is not clear if dominant firms charge lower prices than nondominant firms. On the one hand, if dominant firms have lower costs than fringe rivals and a portion of these lower costs are channeled into lower prices, this will help dominant firms maintain their

leading position[3]. On the other hand, recall that Schmalensee's definition describes nondominant firms as "small price taking rivals". When nondominant firms consider the dominant firm's price as fixed, they may either match the dominant firm's price or cut price to gain market share. (Of course, cost constraints can limit nondominant firm price cutting.)

Hypotheses for First-Mover Advantages

Potential first-mover advantages are measured by a single business characteristic and four industry characteristics. The single business characteristic is market pioneering. Market pioneering helps proxy first-mover advantages that are not included in the four industry characteristics[4]. Because market pioneering often helps a firm gain market dominance, this measure reflects a combination of gaining and maintaining a dominant market position.

Certain types of industries are more likely to yield first-mover advantages than others. A first-mover advantage is more likely to arise for a low-priced consumer good or a high-priced industrial good. See Robinson and Fornell (1985) and Robinson (1988). For a low-priced consumer good, the typical

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[3] Note, relative direct costs is not included in the model because the direction of causation is likely to arise from market dominance leading to lower costs through scale economies. It is less likely that lower relative direct costs will directly influencing market dominance. This is because lower direct costs, per se, do not provide a customer benefit.

[4] Market pioneering also helps control for a key factor that helps gain a dominant position. This is because when a market pioneer starts with a market share of 100%, they have a natural advantage in developing an initially dominant position. Thus, market pioneering reflects a combination of both gaining and maintaining a dominant market position.

purchase amount is less that $10. A first-mover advantage could arise from habitual consumer purchase or from distribution advantages for convenience goods. For a high-priced industrial good, the typical purchase amount is greater than $10,000. A first-mover advantage could arise from switching costs or experience advantages associated with big ticket items.

A first-mover advantage can also arise from economies of scale. This is because the first mover has the opportunity to lower average costs by expanding their scale of operations. Later entrant that do not achieve a similar scale of operations will suffer from higher average costs.

Two industry characteristics measure potential scale economies. If scale economies arise from spreading advertising's fixed costs over a larger sales volume, then it should be easier to maintain a dominant position as industry advertising as a percent of sales increases. Manufacturing scale economies can also help a firm maintain market dominance. Scale economies are measured by the sales from an efficient incremental capacity addition divided by total market sales. For example, when an efficient capacity increment can produce $10 million dollars in annual sales and total market sales are $200 million, the ratio equals 5%.

Hypotheses for Changing Market Conditions

Geroski (1987) speculates that "dominant firms decline when markets shift out from underneath them." For example, constant product changes can limit customer switching costs and provide potential entrants an opportunity to gain a market foothold. Thus, markets are more likely to shift when there are 1) regular seasonal or annual product line changes and 2) products are customized rather than standardized.

Changing market conditions are measured by two other variables. The passing of time, as measured by market age, provides more opportunities for markets to shift. It also provides more opportunities for managers to become "sleepy" (Geroski 1987). Finally, large markets and the rapid growth that often drives market sales to a high level can be too much for a single firm to handle. Thus, increasing market sales should tend to limit market dominance.

4. Data

The PIMS (Profit Impact of Market Strategies) data at the Strategic Planning Institute cover business units[5]. Each business is encouraged to form a data gathering team composed of marketing, manufacturing, finance, and R&D managers. Each observation describes the entry strategy, entered market, competition, operating results, and balance sheet information. As mentioned above, dominant firms are defined as having a market share 1) that is at least 50% and 2) is at least twice as large as the second largest market share.

The sample is limited to established businesses in growing and mature markets. To focus on established dominant positions, businesses in the product life cycle's introductory stage are deleted. Because their dominance may have

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[5] Because different literatures use different terms, the terms dominant firm and dominant business are used interchangeably. A dominant firm is from the economics literature. A dominant business arises because the PIMS data covers business units.

arisen from recent market exits, businesses in the decline stage are deleted. Finally, businesses with one or more missing observations are deleted[6].

The sample has 2336 observations. 29% are consumer goods and 71% are industrial goods. For the 341 industries dominated by a single firm, only 15% had started prior to 1930. Thus, the dominant firms are more likely to have been formed from innovation than from a turn of the century merger.

Even though the cross-sectional PIMS data do not provide detailed insights into the firm's history, the dominant firms are probably composed of very successful market pioneers and other early market leaders. This is because research such as Golder and Tellis (1993) indicates that leading market share positions tend to be formed in the early years of a market's evolution. Thus, given the typical market age and their dominant market share, the majority have probably maintained their dominant positions for decades.

While PIMS data limitations are well known, they should be recognized in the context of this study. First, PIMS businesses are self-selected with most of them belonging to Fortune 1000 firms. While this is an important sample of U.S. businesses, it misses small and local markets that are dominated by a single competitor, such as a local newspaper.

Second, because each business reports confidential information, the business as well as the industry are anonymous. Thus, it is not possible to complement the cross-sectional research with industry specific insights. See

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[6] In estimating the industry advertising-to-sales ratio, missing observations for competitors advertising spending are assumed to equal the businesses spending. In estimating manufacturing scale economies, missing observations are assumed to equal the sample mean. These two assumptions increase the sample size by roughly 10%.

White (1983), Scherer and Ross (1990), and Shepherd (1990) for industry specific insights.

Third, the PIMS data were typically gathered in the mid-1970's to the early 1980's. While more recent data would be desirable, the sources used to maintain market dominance today should not differ dramatically from this earlier time period. This is because given the slow decline of dominant market positions (Geroski 1987), many dominant firms in the the mid-1970's to the early 1980's should remain dominant today.

Variables and Definitions

Table 2 defines the key variables. While most definitions are directly available from the data, a few such as industry advertising/sales, market age, and market sales must be estimated. For example, each of these estimates is derived by using the midpoint of one or more categorical variables. Because this approach increases random measurement error, the empirical results will be weakened.

Keep in mind that almost none of the industrial markets have 1) intensive advertising that is necessary for a meaningful scale economy or 2) seasonal or annual product line changes. Thus, the industry advertising/sales and seasonal or annual product line change results apply to consumer markets. Because almost none of the consumer markets have customized products, the customized product result applies to industrial markets.

Descriptive Statistics

Table 3 summarizes a number of key business characteristics for dominant firms, nondominant firms in a dominant firm industry, and firms in other

TABLE 2

Variable Definitions

Variable	Definition[a]
Dominant Firm	1 if the business's market share is at least 50% and is at least twice the market share of the next largest competitor, 0 otherwise.
Dominant Firm Industry	1 if one business in the industry is a dominant firm, 0 otherwise.
Relative Product Quality	The percentage of this business's sales volume accounted for by products and services that, *from the perspective of the customer*, 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: Broader 0: Same -1: Narrower
Relative Price	The average level of selling prices for the business's products and services relative to the average level of the three largest competitors. Example: If prices average 5% above those of the leading competitors, report 105%.
Market Pioneer	At the time this business first entered the market, was it: 1 = one of the pioneers in first developing such products or services, 0 = otherwise.
Low-Priced Consumer Good	1 if the product is a consumer good and the purchase price is typically less than $10, 0 otherwise.

TABLE 2 (continued)

Variable	Definition
High-Priced Industrial Good	1 if the product is an industrial good and the purchase price is typically more than $10,000, 0 otherwise.
Industry Advertising / Sales	The industry advertising-to-sales ratio is estimated by combining the business's advertising-to-sales ratio, advertising expenditures relative to the three leading competitors, the business's market share, and 100 less the business's market share.
Manufacturing Scale Economies	The minimum economically efficient amount in sales by which the business's standard capacity can be increased divided by served market sales.
Customized Product	1 if the product is customized rather than standardized, 0 otherwise.
Seasonal or Annual Product Changes	1 if the typical practice for the business and its major competitors is to change all or part of the product line either seasonally or annually, 0 otherwise.
Ln (Market Age)	The natural logarithm of the market's estimated age in years.
Ln (Market Sales)	The natural logarithm of the estimated market sales in millions of dollars at the manufacturing level. The business's sales are estimated by combining the products typical purchase amount, purchase frequency, and the number of immediate customers. Market sales equal the business's sales divided by their market share.

a) See the PIMS Data Manual (1978) for additional insights into the variable definitions.

TABLE 3
Descriptive Statistics

Variable	Dominant Firm Industries: Dominant Firms	Dominant Firm Industries: Nondominant Firms	Other Industries
	(n=217)	(n=124)	(n=1995)
Relative Product Quality	47%	9%	23%
Relative Product Line Breadth	2.58	1.65	2.03
Relative Price	107%	103%	103%
Market Pioneer	78%	40%	50%
Relative Direct Costs	100%	106%	102%
Market Share	67%	15%	20%
Return on Investment	39%	13%	20%

industries. Because monopolies are rare in large and established markets, the remaining markets are all classified as either an oligopoly or a fragmented market[7]. Following Parry and Bass (1990), a fragmented market arises when the sum of the market share levels for the firm plus the three leading competitors is less than 55%. An oligopolistic market arises when it is not dominated by a single firm and the sum of the four market share levels is at least 55%.

The entire sample is composed of 9% dominant firms, 5% nondominant firms in dominant firm industries, 62% oligopolies, and 24% fragmented markets. The relatively high percentage of firms in dominant industries and in oligopolies arises because the PIMS data are 1) composed of relatively successful businesses and 2) have relatively narrow market boundaries. (Relatively narrow market boundaries tend to have fewer competitors, which yields more dominant firms and oligopolies.)

Note, only 14% of the sample's market pioneers are dominant firms. (The estimate is not shown in the table.) In addition, the PIMS data only cover surviving businesses. These results indicate the vast majority of market pioneers can not maintain a dominant market share over the decades.

Using Table 2's definitions, dominant firms in Table 3 have higher product quality, broader product lines, and command a 7% price premium versus the leading competitors in the market. 78% report that they were one of the market pioneers. The unusually high percentage of market pioneers arises because businesses in the PIMS data tend to be relatively successful and order of

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[7] Four observations where the leading competitor's market share equals zero are deleted from the sample. It is not clear if these observations are monopolies or missing data.

market entry is collapsed into only three categories. Average direct costs equal competition.

For overall business performance, market share averages 67% and return on investment (ROI) averages 39%. (White's 1983 study also finds strong financial performance for dominant firms.) While an ROI of 39% is unusually high, it is not adjusted for inflation, which was relatively high when the data were reported. ROI is also before interest and taxes. Even so, these results indicate that dominant firms tend to earn higher dollar profits from both their higher market share as well as their higher ROI.

The nondominant firms in dominant firm industries have product quality and price levels that are somewhat higher than competition. Product lines are relatively narrow and their direct costs average 6% more than competition. Given this profile, it is not surprising that these firms have an average market share of 15% and a relatively low ROI of only 13%.

Note, 55% of these nondominant firms have the second highest market share and 29% have the third highest market share. Thus, market share and ROI performance should be even lower for a typical nondominant firm in a dominant firm industry.

For firms in other industries, product quality and prices are both somewhat higher than the three leading competitors. Product line breadth essentially equals competition, while direct costs are 2% higher. Market share and ROI both average 20%. Thus, for these three categories of firms, average market share and ROI performance is highest for dominant firms and lowest for firms in industries that are dominated by another firm.

5. Model Specification and Estimation

The model specifications address three questions that are linked to the different types of firms in Table 3. First, how do dominant firms differ from other firms that are in a dominant firm industry? This model compares 217 dominant firms to 124 nondominant firms. (Firms in Table 3's first versus second column.) Because each firm is in a dominant firm industry, industry characteristics that help distinguish dominant from nondominant firm industries are not required. Thus, the independent variables are all business characteristics.

Second, how do dominant firm industries differ from other industries? This model compares 341 dominant firm industries to 1995 industries that are typically oligopolies. (Firms in Table 3's first and second columns versus the third column.) For this industry level model, the independent variables only cover industry characteristics. Because the dependent variable covers the most dominant firm industries, this model provides the best industry level insights.

Third, how do dominant firms differ from a broad cross section of firms? This model compares 217 dominant firms to 2119 nondominant firms. (Firms in Table 3's first versus second and third columns.) In the sense that the independent variables cover both business and industry characteristics, this approach combines the first and second models.

Because each dependent variable is a dummy variable, the data analysis uses logit regression. Note, the dependent variable for the third model is a dominant firm dummy variable, which is more appropriate to use than market share. The problem with using market share is that first-mover advantages can increase market share for dominant firms but decrease it for small, fringe rivals.

(The reverse can happen for changing market conditions.) For example, increasing manufacturing scale economies should tend to increase market share for dominant firms, but decrease it for small, fringe rivals. Thus, for these industry characteristics, the directional impact on market share is ambiguous.

6. Results

How do dominant firms differ from nondominant firms in dominant firm industries? Table 4 provides the logit regression results. The model fit in terms of the χ^2 test for overall model significance and the U^2 value of 40% are both encouraging. (Guadagni and Little 1983 discuss these goodness of fit measures.) Statistical significance is evaluated using conservative two-tail tests.

Relative product quality and relative product line breadth have the highest levels of statistical significance. Market pioneering is also associated with market dominance. Holding relative product quality constant, relative price does not have a meaningful impact on market dominance. These results suggest that in terms of maintaining market dominance, nonprice competition is much more important than price competition.

Keep in mind that pricing decisions play an important role is influencing profits and limit pricing models show that expected profits play an important role in motivating entry and fringe firm expansion. Because the results only estimate the impact of price relative to competition, they can not infer the importance of the absolute price level on market dominance. Thus, while prices relative to existing competitors do not appear to play a major role in explaining market dominance, absolute price levels should influence both entry and fringe firm expansion.

TABLE 4
Logit Regression Results for Dominant versus Nondominant Firms

Variable and Expected Sign	Dominant Versus Nondominant Firms
	(n=341)
Constant (+/-)	-1.97[a] (-1.00)
Relative Product Quality (+)	.03 (6.07)***
Relative Product Line Breadth (+)	1.23 (6.09)***
Relative Price (-)	-.02 (-.87)
Market Pioneering (+)	1.21 (3.88)***
Model $\chi^2_{(4)} = 89.28$*** $U^2 = .40$	

a) Below each coefficient is the asymptotic t-value. The significance levels are based on two-tail tests with * = 10%, ** = 5%, and *** = 1% significance.

Why are some industries dominated by a single firm while most are not? In Table 5, manufacturing scale economies has the highest statistical significance. Market dominance tends to be favored for low-priced consumer goods and for high-priced industrial goods. While industry advertising/sales has the expected positive sign, it is not even close to being statistically significant.

The other industry characteristics in Table 5 measure changing market conditions that should limit market dominance. The strongest statistical significance arises for market sales (Ln Market Sales), which indicates it is easier to dominate a small market. Also, market dominance tends to be discouraged when 1) the product is customized rather than standardized and 2) in relatively old markets. The impact of seasonal or annual product changes is significant at the 11% level[8].

How do dominant firms differ from firms in other industries? In Table 6, higher product quality and broader product lines have a significant impact on market dominance. Market pioneering is also associated with market dominance. The impact of price though is not even close to being statistically significant. Thus, the results for business characteristics are consistent with those in Table 4.

Results for the industry characteristics that measure first-mover advantages are similar to those in Table 5. The results for changing market conditions are generally similar to those in Table 5. While the seasonal or

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[8] Other industry characteristics that were tried are 1) customer service importance, 2) a market maturity dummy variable, and 3) a recent technological change dummy variable. None of these variables were statistically significant.

TABLE 5
Logit Regression Results for Dominant versus Nondominant Firm Industries

Variable and Expected Sign	Dominant Versus Nondominant Firm Industries
	(n=2336)
Constant (+/-)	-.04[a] (-.12)
Low-Priced Consumer Good (+)	.64 (3.03)***
High-Priced Industrial Good (+)	.48 (3.33)***
Industry Advertising / Sales (+)	.02 (.52)
Manufacturing Scale Economics (+)	.05 (7.87)***
Customized Product (-)	-.68 (-3.91)***
Seasonal or Annual Product Changes (-)	-.71 (-1.63)
Ln (Market Age) (-)	-.30 (-3.22)***
Ln (Market Sales) (-)	-.22 (-7.69)***
Model $\chi^2_{(8)} = 110.92$*** $U^2 = .11$	

a) Below each coefficient is the asymptotic t-value. The significance levels are based on two-tail tests with * = 10%, ** = 5%, and *** = 1% significance.

TABLE 6
Logit Regression Results for Dominant Firms versus Other Types of Firms

Variable and Expected Sign	Dominant Firms Versus Other Types of Firms (n=2336)
Constant (+/-)	-5.68[a] (-4.90)***
Relative Product Quality (+)	.02 (6.65)***
Relative Product Line Breadth (+)	.84 (6.64)***
Relative Price (-)	.01 (.52)
Market Pioneering (+)	.98 (4.98)***
Low-Priced Consumer Good (+)	.54 (1.85)*
High-Priced Industrial Good (+)	.81 (4.12)***
Industry Advertising / Sales (+)	.03 (.72)
Manufacturing Scale Economies (+)	.06 (7.90)***
Customized Product (-)	-.58 (-2.59)***
Seasonal or Annual Product Changes (-)	-1.87 (-1.83)*
Ln (Market Age) (-)	.17 (1.34)
Ln (Market Sales) (-)	-.33 (-8.18)***
Model $\chi^2_{(12)} = 216.27$***	$U^2 = .30$

a) Below each coefficient is the asymptotic t-value. The significance levels are based on two-tail tests with * = 10%, ** = 5%, and *** = 1% significance.

annual product change measure is now marginally significant instead of marginally insignificant, the most important difference is for market age.

One explanation for the mixed results for market age are that the data are cross-sectional rather than time series. This is because Geroski's (1987) survey of studies that use time-series data concludes that dominant firm market share levels typically decline slowly over time.

Model Simultaneity

One limitation of a logit regression is that the direction of causation is not always clear. For example, the models assume that relative product quality influences market dominance. A dominant image though could positively influence a customer's perception of perceived product quality. Because the majority of the sample are industrial goods that are often evaluated using objective engineering characteristics, dominant firm image should not be a major factor in establishing product quality. Also, average product quality is essentially equal for dominant consumer versus dominant industrial goods firms (47 versus 48). Thus, market dominance does not appear to have a major influence on perceived product quality.

Even so, market dominance could influence industry advertising/sales. This is because oligopolistic markets often emphasize nonprice competition, such as advertising. See Scherer and Ross (1990, Ch. 16). Because a dominant firm can avoid the self-cancelling nature of heightened advertising, the presence of a dominant firm should help lower industry advertising. Thus, an industry advertising/sales equation is added to the Table 5's industry level model. The additional explanatory variables in the industry advertising/sales equation are the statistically significant industry characteristics in Caves (1986).

Because industrial goods have limited advertising, the model is estimated across consumer goods. Following, Moore, Boulding, and Goodstein (1991), an instrumental variable was formed for industry advertising/sales from the purely exogenous model variables. In these logit regression results, industry advertising/sales does not significantly influence market dominance. Thus, the empirical results are robust to this potential simultaneity.

7. Summary and Conclusions

In recent decades, most dominant positions in the U.S. have probably arisen from some type of innovation, broadly defined. The empirical results tend to support Shepherd's (1991, p. 167) observation that "*dominance usually pays and dominance usually stays*". Dominance usually pays in the sense that dominant firms in the PIMS data have an above average ROI. Because dominant firms also have an above average market share, both factors contribute to higher dollar profits. Economic research such as Caves, Fortunato, and Ghemawat (1984) and Geroski (1987) on dominant firms in established markets indicates that because dominant positions gradually decline over time, dominance usually stays.

A dominant position can be maintained from operating and first-mover advantages. Operating advantages are business characteristics that are based on superior skills or resources. Across 217 dominant firms in the PIMS data, operating advantages tend to arise in terms of both higher product quality and broader product lines. For a given level of product quality, lower prices do not help maintain market dominance.

The relative importance of price versus nonprice competition is consistent with White's (1983) in-depth industry studies. She concludes that dominant firms "use price as a competitive device but only for short-run strategic moves. Non-price policies . . . are more common and more important in their long-run effect on competition" (p. 123). Also, Geroski's (1987, p. 159) survey of dominant firms concludes "Pricing is generally not a strategic weapon of great importance in post-entry battles".

First-mover advantages are proxied 1) by whether or not the business was one of the market pioneers and 2) by four industry characteristics. Industry characteristics are used because some industries are more likely to yield first-mover advantages than others. In the empirical results, there tend to be more dominant firms in industries where first-mover advantages are important. For example, where there are important manufacturing scale economies and in industries with low-priced consumer goods or high-priced industrial goods.

Changing market conditions can offset operating and first-mover advantages. In the empirical results, there tend to be fewer dominant firms when the product 1) is changed on a seasonal or annual basis and 2) it is customized rather than standardized. More importantly, market dominance is discouraged by increasing market sales.

These results yield a general profile of a dominant firm. A dominant firm has relatively high product quality and relatively broad product lines. While prices are higher than competition, they reflect the higher perceived product quality. Industries that favor market dominance have important manufacturing scale economies and are relatively small. It is more difficult to dominate a market that has frequent product change in terms of customized products or regular product line changes.

How does this study differ from earlier research on market pioneers? A typical market pioneer in the PIMS data has modest product quality advantages and an average market share of around 28% (Robinson and Fornell 1985 and Robinson 1988). Dominant firms in the PIMS data have important product quality advantages. This suggests that if a firm wants to maintain a dominant market position, it is important to maintain higher product quality.

Limitations

While it is conceptually easy to distinguish operating and first-mover advantages, it is not easy to do this empirically. In particular, a number of operating advantages are influenced by first-mover advantages. The most likely operating advantage that mixes up these two forces is product line breadth. This is because Robinson (1988) reports for both consumer and industrial goods, market pioneers tend to have broader product lines than late entrants. Although market pioneers have somewhat higher product quality, this advantage is not as strong or as enduring as having broader product lines.

While the model examines typical dominant firms, research indicates that dominant firms can differ. For example, Gaskins (1971) theoretically examines dominant firms in terms of whether or not they have a sustainable unit cost or image advantage. White (1981) provides industry insights into dominant firms that sell either branded consumer goods or high-tech products. Thus, future research could provide more detailed insights into the strategies and performance of different types of dominant firms.

Conclusion

Schmalensee (1987, p. 68) says, "Market dominance is not inevitably long-lived but, if it is protected by substantial and continuing operating or strategic advantages, it may persist for many decades". This study supports Schmalensee's observation in the sense that these dominant firms, in all liklihood, typically created their dominant position decades ago and maintain it by having important operating and first-mover advantages.

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