RESEARCH SUPPORT
UNIVERSITY OF MICHIGAN BUSINESS SCHOOL

AUGUST, 1990

THE IMPACT OF SKILLS AND RESOURCES OF MARKET ENTRY

WORKING PAPER #642

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Abstract

Are market pioneers more successful simply because they started with superior skills and resources? Assuming that market pioneering is desirable, firms with superior skills and resources may naturally choose to pioneer new markets. A second view is that market evolution changes success requirements. Market pioneer skills and resources are different, but are not superior to early followers and late entrants. Based on a sample of 177 start-up ventures, the empirical results indicate that market evolution changes success requirements. They do not indicate that market pioneers typically start with superior skills and resources.

The authors are indebted to Peter Lenk for many helpful comments. The Strategic Planning Institute is thanked for providing access to the start-up business data. The conclusions are those of the authors.

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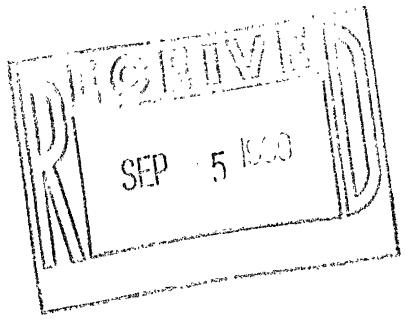

The Impact of Skills and Resources on Order of Market Entry

August 1990

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The Impact of Skills and Resources on Order of Market Entry

The empirical evidence consistently indicates that pioneers in mature markets tend to outperform later entrants. For examples, see Robinson and Fornell (1985), Urban et al. (1986), and Robinson (1988a). Market pioneer superiority is indicated by higher average market shares, well known brand names, broader product lines, and, to a lesser degree, superior product quality.

What is the source of this market pioneer superiority? On the one hand, if market pioneers developed these advantages because they moved first, then the causal relationships described by the aforementioned authors are supported. Hence, market pioneers often have an important opportunity to develop sustainable competitive advantages. This causal impact helps justify costly and risky investments associated with a market pioneering attempt.

On the other hand, Lieberman and Montgomery (1988) speculate, "first-movers may be intrinsically 'stronger' or more proficient than later entrants" (p. 51). Assuming that market pioneering is desirable, then firms with superior skills and resources should naturally choose to pioneer new markets. When a market share advantage arises because a pioneer started with superior skills and resources, the order of market entry and market share relationship is spurious.

In an attempt to shed light on the causal versus spurious nature of this relationship, Moore, Boulding, and Goodstein (1990) model market pioneering as endogenous. The results indicate that numerous pioneer advantages reported by Robinson and Fornell (1985) are biased upwards. Because pioneers still hold certain types of advantages, their results indicate the order of market entry and market share relationship is a complex combination of spurious and causal factors.

While Moore, Boulding, and Goodstein (1990) examine established businesses, a critical question concerns the source of these skill and resource differences. If the source is first-mover advantages, then superior skills and resources simply reflect market pioneer rewards. If the source is based on advantages at the time of entry, then pioneer market share advantages should be adjusted downwards.

To illustrate the distinction, take the example of Coca-Cola. This company is known to have strong skills and resources. Without going back to the time of entry, one cannot tell if these skills and resources were developed over the years or simply leveraged from a strong parent. At the time it pioneered the cola market, Coca-Cola was a new venture (Cleary 1981). Thus, rather than starting with superior skills and resources, Coca-Cola successfully cashed in on a major first-mover opportunity.

This study examines start-up ventures at the time of entry. Such data are necessary to sort out the question of first-mover advantages (causation) versus initial skill and resource superiority (spurious association). The data analysis explains order of market entry as a function of the entrant's managerial skills and benefits from parent resources. The sample covers 177 entrants that typically represent diversification efforts of Fortune 500 firms.

Using a multinomial logit model, the empirical results show systematic differences among pioneers, early followers, and late entrants. While each type of entrant has unique characteristics, market pioneers do not tend to start with superior skills and resources. Thus, empirical evidence at the time of entry supports a causal relationship between order of market entry and market share.

EXPLAINING ORDER OF MARKET ENTRY

Following Lieberman and Montgomery (1988), order of market entry is modeled as a function of two broad categories: firm proficiency and luck. Firm proficiency is examined in terms of the entrant's functional skills and the use (or lack of use) of a parent's resources. Luck is modeled as a random error term.

Should the hypotheses be applied to brands or business units? Starting a new business typically requires greater skills and resources than introducing a new brand from an existing business. For example, Schmalensee (1978, p. 317) estimates that a new ready - to - eat cereal brand introduced by a new venture needs at least a 3% market share to be efficient. The corresponding estimate for an existing firm is only 1%. Thus, the hypotheses apply to business units where skill and resource constraints are more likely.

What theoretical literature provides insights into the impact of skills and resources on order of market entry? While the economics literature yields some insights, Lieberman and Montgomery (1988) point out it typically assumes that firms are, "identical along all dimensions except timing and size" (p. 52).

In the marketing strategy literature, Lambkin and Day's (1989) ecology model highlights the impact of firm skills and resources on order of market entry. Also, their order of market entry categories are market pioneer, early follower, and late entrant. These categories are identical to those in the start-up business data, used below. Thus, while Table 1's hypotheses are based on a number of sources, they are heavily influenced by Lambkin and Day's (1989) ecology model.

- Insert Table 1 About Here -

Market Pioneers

How do market pioneer functional skills and parent resources compare to early followers and late entrants? Lambkin and Day's (1989) ecology model describes market pioneers as relatively small, specialist firms that are often new ventures.

Do market pioneers tend to excel in any functional skill area? According to Lieberman & Montgomery (1988), "Firms whose entrepreneurial vision and new-product R&D are excellent will tend to find first-movership attractive" (p. 54). This is consistent with market evolution research that concludes that R&D and engineering are key functions in the early years and marketing is a key function in the later years (Porter 1980, Ch. 8). Thus, market pioneers should tend to excel in R&D.

For parent resources, Sullivan (1989) argues that market pioneers that are the first to enter should not use an existing brand name. From the parent firm's perspective, an extension links the new product to existing products. Thus, high failure rates in young markets make brand extensions risky. From the customer's perspective, Carpenter and Nakamoto (1989) find that market pioneers often become the industry standard. If the pioneer wishes to become the industry standard, then a brand name that is tied to an existing industry is not as effective. Thus, pioneers should benefit less often from existing brand names and goodwill.

To the extent that market pioneers are relatively small and are often a new venture, they should receive limited benefits from sharing the parent's marketing and manufacturing programs. This is consistent with Lambkin's (1988) descriptive statistics[1].

Early Followers

Lambkin and Day (1989) describe early followers as predominantly, "subsidiaries or divisions of large, integrated firms that have a high degree of synergy with the product-market" (p. 15). This is consistent with Baldwin and Childs (1969) who analyze a "fast second" strategy. Examples of "fast second" strategies include NCR's quick shift to electronic cash registers and Kellogg's reaction to small firms selling granola cereals (Scherer 1980, p. 431).

More specifically, Baldwin and Childs (1969) argue that large firms are relatively efficient at "free-riding" on a pioneer's investment. The fast-second strategy is favored when a large firm has established marketing, distribution, and manufacturing.

Lambkin's (1988) descriptive statistics suggest that early followers have greater shared manufacturing resources. She does not find a significant relationship though between order of market entry and shared marketing resources. Assuming early followers have greater shared manufacturing resources, stronger manufacturing skills should follow.

Late Entrants

Lambkin and Day's (1989) ecology model describes late entrants as, "typically small new ventures set up to exploit a competitive advantage in meeting the needs of one particular market segment" (p. 15). Thus, late entrants should have excellent marketing skills.

Do late entrants benefit more from their parent's brand name/goodwill? On the one hand, because this resource is closely related to excellent marketing skills, late entrants should tend to benefit when this resource is available. On the other hand, if late entrants tend to be relatively small new ventures, then the strong brand name / goodwill resource may not be available. Thus, the extent to

which late entrants benefit from the parent's brand name/goodwill is an empirical question.

Alternative Hypothesis for Relative Parent Size

Lambkin and Day (1989) predict that early followers tend to have the largest parent corporation. Market pioneers and late entrants should be relatively small. Baldwin and Childs (1969) and Wernerfelt and Karnani (1987) make similar predictions in the sense that established giants in related markets can delay entry and still offset first-mover advantages.

An alternative hypothesis is based on numerous studies in the industrial economics literature that examine the impact of firm size on innovation. For examples, see Kamien and Schwartz (1982) and Scherer (1980). This literature is relevant by viewing market pioneering as a source of innovation. Because innovation is often costly, large firms tend to provide a more stable financial environment for long-run R&D projects. Large firms also benefit from economies of scale in R&D and can commercialize innovations faster and more efficiently than small firms.

Large firms though run the risk that affluence can, "breed complacency and disinterest in change" (Scherer 1980, p. 424). Also, certain advantages for large firms may not arise. For example, small scale research labs can be as efficient as large scale labs and capital markets often provide funding for start-up ventures. Given these advantages and disadvantages, the impact of firm size on innovation is an empirical issue.

Empirical research has not found a systematic relationship between firm size and innovation. Kamien and Schwartz (1982) conclude, "The bulk of the empirical findings indicate that inventive activity does not typically increase

faster than firm size, except in the chemical industry" (p. 103). These empirical results suggest that firm size does not typically influence order of market entry.

DATA

The Strategic Planning Institute's (SPI) start-up business data provide detailed information on start-up businesses at the time of entry. Briefly, a start-up business is a new business venture and is typically 7 years old or less (Start-Up Data Manual 1978). A start-up business is considered a new source of supply by its customers and a new entrant by its competitors. These start-up ventures all survived at least the first 2 years of commercialization. (For more information on the start-up data, see Robinson 1988b).

The Start-Up Data Manual (1978) recommends that a data-gathering team be formed of managers in marketing, finance, manufacturing, and R & D. Because a team supplies the data, the study is based on self-reported, single-informant data supplied by the entrant. The start-up venture managers evaluate market boundaries, order of market entry, firm skills, and shared parent resources.

The entrants are clients of the Strategic Planning Institute and typically represent diversification efforts of Fortune 500 firms. Thus, they presumedly had stronger skills and resources than a typical random sample of entrants.

Even so, diversification entry is not unusual. Dunne, Roberts, and Samuelson (1988) estimate that the breakdown between diversification and new firm entry in U. S. manufacturing is roughly 45%/55%. Benefiting from diversification entry is also not unusual. Dunne, Roberts, and Samuelson (1988)

report that roughly 80% of their diversifying entrants shared existing manufacturing facilities.

The sample composition is a strength by providing a relatively close correspondence to the sample used to estimate the market pioneer advantages in Robinson and Fornell (1985) and Robinson (1988a). Thus, it provides insights into the extent to which initial firm skills and resources influence market pioneer advantages for businesses in Fortune 500 firms.

The sample composition is a weakness in terms of testing Lambkin and Day's ecology model. Their model suggests that market pioneers and late entrants are often independent ventures. Because independent ventures are under-represented, the start-up business data does not provide an ideal test. Even so, Lambkin (1988) generates empirical insights from the start-up data that are consistent with the ecology model. Thus, despite its limitations, the start-up data should be quite useful.

Variable Definitions

Table 2 provides the variable definitions. Order of market entry is based on the time of market entry (Start-Up Data Manual 1978). Two market pioneer categories are provided. A first entrant market pioneer is "the first business to develop such products or services". Other market pioneers are "one of the pioneers in developing such products or services". While the hypotheses do not distinguish between first entrants and other market pioneers, the empirical results indicate the distinction is worthwhile.

An early follower entered a still growing, dynamic market. A late entrant entered a more established market situation.

- Insert Table 2 About Here -

The start-up data have many skill and resource measures. Skills assess the functional skills within the start-up venture. They, "indicate the level of familiarity with the skills required by this business supplied by the original operating managers" (Start-Up Data Manual 1978). These measures are similar to the functional expertise measures that Lilien and Yoon (1990, p. 576) relate to new product development time.

Functional skill measures evaluate marketing, finance, manufacturing, and R&D. The only multiple measures are available for marketing skills. The measures assess distribution methods, selling methods, and marketing practices. Since the simple correlations between these three measures range from .70 to .83, the mean value is used.

Because required skills change as a market evolves, these variables measure the entrant's skills versus the market's success requirements at the time of entry. Because many skills become obsolete or outdated, this measurement option is more appropriate than comparing absolute skill levels over time. For example, it is not appropriate to compare Apple's pioneering R&D skills in personal computers in 1977 versus IBM's later entry skills in 1981.

Even so, the more market evolution influences success requirements, the more difficult it is to make accurate comparisons across market pioneers, early followers, and late entrants. As a market evolves, technology related skills are probably most likely to change. Thus, success requirements are most likely to change for R&D skills, and possibly manufacturing skills as well. While required marketing and finance skills also change over time, they reflect general business skills that are more stable. Thus, dynamic comparisons using the start-up data are probably more accurate for marketing and finance skills.

Four measures assess shared parent company resources. Established brand names or goodwill that benefited the entrant are examined. Shared marketing resources and shared manufacturing resources are also examined. Finally, the entrant's total firm sales is measured versus the largest competitor. This is a rough proxy for having a parent with "deep pockets", which indicates that available funds are more likely for financially viable projects[2].

The relative parent size measure is versus the leading competitor in the year prior to entry. By definition, first entrants did not face any competitors in the year prior to entry. This yields a missing value. Rather than deleting all first entrants from the model, which is done for other missing values, the mean value for the other market pioneers is substituted. Because first entrants make up only 8% of the sample, the relative size measure for the remaining 92% of the sample should be reasonably accurate.

Sample and Descriptive Statistics

The sample excludes nonmanufacturing entrants and entrants that did not report a full set of independent variables. The exclusions reduce the sample size from 199 to 177. The industrial/consumer goods split is 78%/22%.

Related diversification clearly dominates unrelated diversification. 88% of the entrants shared at least one of the following three parent resources: the parent's brand name/goodwill, the parent's marketing resources, or the parent's manufacturing resources.

Table 3's descriptive statistics relate firm skill and resource measures to order of market entry. F - tests assess the potential nonlinear relationships predicted by the ecology model. Only two of the eight F - tests are significant at the 10% level or better. The significant results suggest that first entrants have

relatively weak manufacturing skills and that early followers have the greatest proportion of shared manufacturing resources.

- Insert Table 3 About Here -

While Table 3 does not show the correlations, the simple correlation between the marketing and finance skill familiarity measures is .61. Marketing and finance skills are associated with "demand-pull" innovations that are initiated by recognizing a commercial opportunity. The correlation between R&D and manufacturing skill familiarity is .41. R&D and manufacturing skills are associated with "technology-push" innovations. (See Kamien and Schwartz 1982 for a discussion of demand-pull and technology-push.) While descriptive statistics are insightful, the hypothesis testing uses a multinomial logit model.

MODEL SPECIFICATION & ESTIMATION

The model specification is a multinomial logit:

$$(1) \qquad P(Y = j / X_i) = \frac{e^{\beta'_j X_i}}{\sum_{j=1}^{4} e^{\beta'_j X_i}}$$

where $P(Y = j / X_i)$ is the expected probability that the order of entry decision j is selected for the i_{th} entrant whose skills and resources are measured by the X_i vector. As mentioned above, the order of entry decision j covers four categories.

The categories are first entrant, other market pioneer, early follower, and late entrant.

The β_j vectors are estimated by applying maximum liklihood estimation to the logarithm of the odds ratio. Each odds ratio is versus the late entrant category. With 4 order of entry categories, this yields 3 equations and three β_j vectors to estimate. (To provide a benchmark, the β_4 vector for late entrants equals the 0 vector.) In the 3 equations, first entrants, other market pioneers, and early followers are evaluated versus late entrants. For example, equation 2 is the logarithm of the expected probability of first entry relative to the expected probability of late entry.

$$(2) \qquad \log \frac{P\,[\text{First Entry}_i]}{P\,[\text{Late Entry}_i]} = \beta'_1 X_i$$

RESULTS

Goodness of fit in Table 4 is evaluated by the likelihood ratio statistic, which has a chi-squared distribution. The statistic tests the joint null hypothesis that each coefficient, except the intercept, equals zero. The chi-squared statistic equals 411, which is statistically significant at the 1% level. Statistical significance for individual coefficients uses asymptotic t-values and is conservatively based on two-tailed tests.

- Insert Table 4 About Here -

While Table 4 provides insights into direction and statistical significance, Table 5 addresses economic significance. Economic significance uses the multinomial estimates to generate expected order of market entry probabilities. The first set of probabilities yields a benchmark for skills and resources that equal the sample mean for each variable. The benchmark entrant has a 6% chance of being a first entrant, 27% of being an other market pioneer, 33% of being an early follower, and 33% of being a late entrant. These are close to the true sample values of 8%, 27%, 31%, and 34%.

More important, changing single independent variables while holding other variables at the sample mean yields insights into the economic significance of individual coefficients. For example, as marketing skills increase from unfamiliar to very familiar, the probability of first entry decreases from 7% to 4%.

- Insert Table 5 About Here -

The statistically significant results in Table 4 that are consistent with the hypotheses are described first. A brief discussion of the most surprising results and nonresults follows.

In Table 4, benefiting from the parent's brand names and goodwill significantly reduces the probability of first entry. In Table 5, the expected probability declines from 10% to 3%.

Early following versus late entry is not significantly influenced by any of the skill familiarity measures. However, shared manufacturing facilities tend to increase the probability of early following. Table 5 estimates that increasing shared manufacturing resources from 5% to 90% increases the probability of early following from 24% to 48%. These results suggest that when a market pioneer

uncovers a commercial opportunity, early followers in related markets often enter by leveraging existing manufacturing resources.

In Table 4, increasing marketing skills significantly increases the probability of late entry. In Table 5, increasing marketing skills from unfamiliar to very familiar increases the probability of late entry from 12% to 51%. Table 4 also indicates that increasing relative parent size decreases the probability of late entry. In Table 5, increasing parent size from smaller to larger relative to the largest competitor decreases the probability of late entry from 43% to 22%. Thus, a relatively small firm skilled in marketing seems well suited for late entry in a market niche.

The most surprising results arise for market pioneers. In Table 4, an increase in manufacturing skill familiarity significantly decreases the probability of first entry. In Table 5, increasing manufacturing skills from unfamiliar to very familiar decreases the probability of first entry from 23% to 2%.

While this result was not predicted, it seems plausible. Since being the first to manufacture a new product is often difficult, it is not surprising that first entrants were less familiar with required manufacturing skills.

A more perplexing result is that increasing finance skills significantly increases the probability of both types of market pioneering[3]. This is surprising because 1) financially oriented firms in North America are often criticized for having a short-term orientation (Fortune 1989) and 2) attempting to pioneer a new market usually requires a long-term orientation. Even so, finance skills help discount the long-term expected gains associated with market pioneering. Also, because the typical entrant is a Fortune 500 diversification effort, financial skills can help secure internal funding for these risky ventures.

The most surprising "nonresult" is also associated with market pioneers. The literature consistently points to market pioneers excelling in R&D. As

shown in Table 4, R&D familiarity does not significantly increase the probability of either type of market pioneering. It is possible that this is a result of both sample and measurement factors[4].

In this sample, 50% of the first entrants and 25% of the other market pioneers have intensive R&D that exceeds 50% of sales over the first 2 years of commercialization. This compares to 11% for early followers and 10% for late entrants[5]. (Intensive R&D includes both product and process R&D.) Thus, 7 of the 14 first entrants had intensive R&D versus only 6 of the 60 late entrants.

Also, Wernerfelt and Karnani (1987) recommend, "a firm should focus its resources on the scenario under which it has the strongest position relative to its competitors" (p. 191). Assuming businesses tend to enter when their skills match the market's success requirements, market pioneers should have superior R&D skills. Therefore, this nonresult may be driven by the small sample of market pioneers with intensive R&D and the difficulty of measuring R&D skill familiarity as a market evolves.

Consumer versus Industrial Goods

How robust are the results to the consumer-industrial goods distinction? The consumer goods sample of 39 entrants is too small to support a multinomial logit model. The industrial goods sample size of 138 appears adequate.

Coefficient magnitudes are compared for the total sample results versus the industrial goods results. For the total sample's statistically significant coefficients, only 2 coefficients deviate by more than one standard deviation from the industrial goods results. Finance skill coefficients increase from 1.11 to 1.79 for first entrants and from 1.34 to 2.07 for other market pioneers. This suggests that finance skills are more influence for pioneers in industrial markets. Because many industrial sales are cost justified, this result seems reasonable.

It is also worth noting that the shared manufacturing coefficient increases for first entrants and from 1.13 to 1.43, for other market pioneers from .92 to 1.51, and for early followers from 1.76 to 2.10. This consistent pattern of increases suggests that shared manufacturing facilities have a greater influence on market pioneering and early following in industrial markets.

Implications for Sustainable Market Pioneer Advantages

What are the implications of these results for the sustainable market pioneer advantages reported in studies such as Robinson and Fornell (1985), Urban et al. (1986), and Robinson (1988a)? Because 78% of this sample are industrial goods entrants, the most appropriate point of comparison is Robinson's (1988a) industrial goods study.

Robinson (1988a, p. 89) reports an average market share for pioneers of 29%, early followers 21%, and late entrants 15%. If market pioneers start with superior skills and resources, these market share advantages are biased upwards. The results reported in this study indicate that different types of skills and resources are associated with different types of market entry. They do not indicate that certain types of entrants are superior to others.

For example, compare both types of market pioneers to late entrants (Robinson uses the PIMS definition, which includes both types). Market pioneers tend to have superior finance skills, but inferior marketing skills. First entrants also have problems with being the first to manufacture a pioneering product. While the other market pioneers tend to be larger than late entrants, first entrants tend to receive fewer benefits from the parent's brand name/goodwill. Overall, these results point to order of market entry differences. They do not indicate a superiority that biases average pioneer market share performance upwards.

In explaining pioneer market share advantages versus late entrants, Robinson (1988a) reports pioneers tend to have superior product quality and broader product lines[6]. Is either product advantage biased upwards because of initial market pioneer superiority?

Of course, it is difficult to link initial skills and resources to product related advantages that arise decades later in a mature market. For example, roughly 80% of the pioneers in Robinson's sample were in the market for more than 20 years. However, R&D skills should influence initial product related advantages. The descriptive statistics above suggest this advantage arises for roughly one-third of the sample's market pioneers. (This includes first entrants as well as other market pioneers.)

Manufacturing skills, marketing skills, shared parent brand names/goodwill, and shared manufacturing facilities should also influence product advantages. In these four areas, the empirical results indicate that pioneers in industrial markets have a mixture of competitive advantages and disadvantages. On balance, it does not appear that a pioneer's product related advantages in mature markets are attributed to superior functional skills or shared parent resources at the time of entry[7].

SUMMARY

A multinomial logit model was used to explain the order of market entry decision. Various entrant skills and parent corporation resources significantly influence the order of entry decision. General patterns that arise are that increasing finance skills increases the probability of market pioneering, especially in industrial markets. Benefiting from a parent's brand name/goodwill reduces

the probability of first entry. Increasing shared manufacturing facilities enhances the probability of early following, especially in industrial markets. Marketing skills increase, while relative parent firm size decreases the probability of late entry. This suggests that a relatively small firm skilled in marketing is well suited for late entry in a market niche.

Overall, these results do not support the notion that market pioneers have superior skills and resources at the time of entry. Instead, it appears that different types of skills and resources are associated with different types of entry.

Limitations

For this type of study, measurement limitations can not be avoided. It is clearly difficult to compare skills and resources across entrants as a market evolves. One reason is that success requirements often change dramatically over time. This seems especially true for technology based skills, such as R&D, and perhaps manufacturing as well. A second reason is that critical skill and resource measures often have a subjective component that is open to the entrant's interpretation. Both factors should increase random measurement error, which tends to weaken empirical relationships. Thus, measurement problems could explain certain "nonresults".

Also, order of market entry has a clear random element. For example, serendipity often plays a critical role in market pioneering. Cleary (1981) points out Clarence Birdseye's idea for quick freezing vegetables came from Eskimos who quick froze fish in the snow. Also, the bottle cap inventor motivated King Gillette to develop a disposable product. (King Gillette later pioneered the safety razor and blade market and sold more than one hundred billion disposable blades with his picture on each wrapper.)

Because the sample composition is limited to start-up ventures that are diversification efforts of Fortune 500 firms, it under-represents independent ventures. Despite these sample and measurement limitations, most of the statistically significant results are consistent with the ecology model and other market evolution related predictions.

CONCLUSION

Abell (1978) says, "the 'resource requirements' for success in a business - whether these be financial requirements, marketing requirements, engineering requirements, or whatever- may change radically with market evolution" (p. 21). Because market pioneers, early followers, and late entrants tend to have different skill and resources patterns, the empirical results tend to support Abell's conclusion. Thus, the "strategic window" for entry tends to open at different times for different firm types.

FOOTNOTES

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[1] Shared marketing and shared manufacturing are the two measures in Lambkin (1988) that overlap with this study. While her study also uses the start-up data, different empirical results could arise. Her descriptive insights are extended below using a multinomial logit model. Because this study uses 2 year (STR2) rather than 4 year (STR4) data, the sample size increases from 129 to 177. The larger sample also permits a distinction between first entrant pioneers and other market pioneers, which proves to be useful.

[2] Because these entrants are mainly business units in Fortune 500 firms, they depend on the parent rather than capital markets for funding.

[3] One explanation is that multicollinearity between marketing and finance skills ($r = .60$) biases the marketing coefficient down and the finance coefficient up. With serious multicollinearity though, a model can not accurately estimate individual coefficients. Because four of the six marketing and finance skill coefficients are statistically significant, the multicollinearity problem does not appear to be serious.

[4] The standard deviation for the four skill measures ranges from .67 to .71. Hence, this "nonresult" does not appear to arise because of lack of variation in the R&D skill measure.

[5] In a logit regression with intensive R&D spending as the dependent variable and order of market entry dummies as independent variables, first entrants and

other market pioneers are significantly more R&D intensive than early followers and late entrants.

6 Robinson (1988) also reports that market pioneer share advantages tend to increase as industry value added increases and as the average purchase amount in the industry increases. Because it is not clear how these industry advantages are linked to initial skills and resources, they are not addressed.

7 This begs the question as to the source of the pioneers' initial product related advantages. Alternative explanations include a lucky investment, managerial vision, and perceptual advantages associated with being first.

Table 1
SUMMARY OF HYPOTHESES

Variable	Relative Strength	References
Entrant Functional Skills		
1) Marketing Skills	Late entrants.	Lambkin and Day (1989), Porter (1980) and Lilien and Yoon (1990).
2) Finance Skills	No prediction.	
3) Manufacturing Skills	Early followers.	Baldwin and Childs (1969) and Lambkin and Day (1989).
4) R&D Skills	Market pioneers.	Lambkin and Day (1989), Lieberman and Montgomery (1988), and Porter (1980).
Shared Parent Resources		
5) Brand Names/Goodwill	Early followers & possibly late entrants.	Carpenter and Nakamoto (1989) and Sullivan (1989).
6) Shared Marketing	No relationship.	Lambkin (1988).
7) Shared Manufacturing	Early followers.	Baldwin and Childs (1969) and Lambkin (1988).
8) Relative Parent Size	Early followers	Baldwin and Childs (1969), Lambkin and Day (1989), and Wernerfelt and Karnani (1987).
	versus	
	No relationship.	Kamien and Schwartz (1982).

Table 2
VARIABLE DEFINITIONS

Variable	Definition[a]
First entrant	The first business to develop such products or services.
Other Market Pioneer	One of the pioneers in developing products or services.
Early Follower	An early follower of the pioneer(s) in a still growing, dynamic market.
Late Entrant	A later entrant into a more established market situation.
Marketing Skills	Indicate the level of familiarity of marketing skills required by this business supplied by the original operating managers. (The mean value is used for selling methods, distribution methods, and marketing practices.) 1 = Unfamiliar 2 = Somewhat Familiar 3 = Very Familiar
Finance Skills	Same as above, except for financial management.
Manufacturing Skills	Same as above, except for manufacturing technology.
R&D Skills	Same as above, except for R&D.
Brand Names & Goodwill	1 if the entrant benefited to a significant degree from well-known brand names, trade marks, or other types of goodwill during its first two years of commercialization, 0 otherwise.
Shared Marketing	During the first two years of commercialization, what proportion of the products or services of this business were handled by a pooled sales force and/or promoted through advertising and sales-promotion programs shared with other components of the company? The proportion is estimated by using the midpoint of three category ranges.
Shared Manufacturing	Same as above, except for its plant and equipment and production personnel.
Relative Parent Size	Relative to the largest competitor, in the year prior to entry this firm's total sales were[b] 1 = Smaller 2 = About the same 3 = Larger

a) Variable definitions are from the Start-Up Data Manual (1978).

b) For first entrants, the mean value for the other market pioneers is used.

Table 3
START-UP VENTURE DESCRIPTIVE STATISTICS

Variables	Mean (n = 177)	First Entrants (n = 14)	Other Market Pioneers (n = 48)	Early Followers (n = 55)	Late Entrants (n = 60)	F (n = 177)
A) Entrant Functional Skills						
Marketing Skills	2.21	2.10	2.08	2.17	2.37	1.77[a]
Finance Skills	2.37	2.36	2.50	2.29	2.35	.87
Manufacturing Skills	2.25	1.79	2.38	2.24	2.28	2.58*
R&D Skills	2.22	2.14	2.21	2.20	2.27	.16
B) Shared Parent Resources[b]						
Brand Names & Goodwill	.42	.21	.38	.47	.45	1.23
Shared Marketing	.39	.41	.38	.40	.38	.06
Shared Manufacturing	.42	.41	.43	.51	.33	2.46*
Relative Parent Size	1.79	1.93[c]	1.93	1.80	1.63	1.27

a) For the F tests, * = 10%, ** = 5%, and *** = 1% significance.

b) The first three resource measures are proportions, while relative parent size is on a 3 - point scale.

c) Because the relative parent size definition does not apply to first entrants, the mean vaule for other market pioneers is used.

Table 4
MULTINOMIAL LOGIT RESULTS

Variables	First Entrants vs. Late Entrants	Other Market Pioneers vs. Late Entrants	Early Followers vs. Late Entrants
Constant	-.81	-1.58	-.44
	(-.47)[a]	(-1.33)	(-.41)
Entrant Functional Skills			
Marketing Skills	-.96	-1.38	-.66
	(-1.53)	(-3.24)***	(-1.69)*
Finance Skills	1.11	1.34	.29
	(1.74)*	(2.95)***	(.73)
Manufacturing Skills	-1.23	.21	-.12
	(-2.38)**	(.61)	(-.40)
R&D Skills	.22	-.19	-.02
	(.46)	(-.57)	(-.00)
Shared Parent Resources			
Brand Names/Goodwill	-1.38	-.42	.21
	(-1.78)*	(-.93)	(.50)
Shared Marketing	-.17	-.08	-.18
	(-.17)	(-.14)	(-.30)
Shared Manufacturing	1.13	.92	1.76
	(1.15)	(1.45)	(2.94)***
Relative Parent Size	.56	.57	.43
	(1.39)	(2.16)**	(1.71)*
Model $\chi^2_{24} = 411^{***}$			

a) The values in parentheses are asymptotic t-values. The tests are all two-tailed with * = 10%, ** = 5%, and *** = 1% significance.

Table 5
EXPECTED ORDER OF MARKET ENTRY PROBABILITIES

Variables	First Entrant (%)	Other Market Pioneer (%)	Early Follower (%)	Late Entrant (%)
Sample mean[a]	6	27	34	33
Entrant Functional Skills				
Marketing Skills				
• Unfamiliar	7	53	28	12
• Very familiar	4	14	31	51
Finance Skills				
• Unfamiliar	2	7	37	54
• Very Familiar	8	43	27	22
Manufacturing Skills				
• Unfamiliar	23	17	32	28
• Very Familiar	2	32	31	34
R&D Skills				
• Unfamiliar	4	32	32	32
• Very Familiar	7	24	34	35
Shared Parent Resources				
Brand Names/Goodwill				
• No	10	30	29	31
• Yes	3	22	40	35
Shared Marketing				
• 5%	6	27	35	32
• 90%	6	27	32	35
Shared Manufacturing				
• 5%	5	26	24	45
• 90%	6	26	48	20
Relative Parent Size				
• Smaller	5	22	30	43
• Larger	7	35	36	22

a) The sample mean expected probabilities are based on each independent variable's mean. The other expected probabilities hold the sample mean constant for every variable except the one listed. For example, with unfamiliar marketing skills and a mean value for every other independent variable, the probability of first entry is 7%.

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