AGE, ORDER OF ENTRY, STRATEGIC ORIENTATION, AND ORGANIZATIONAL PERFORMANCE

RODOLPHE DURAND
EM Lyon, Lyon, France

RÉGIS COEURDEROY
Université Catholique de Louvain, Louvain, Belgium

EXECUTIVE SUMMARY

This paper proposes an empirical test of several hypotheses linking age, order of entry, and strategic orientations to a firm's performance. Three strategies are defined: cost-leadership strategy, innovative differentiation, and marketing differentiation. The aim is to show that the impact on performance of both age and each of the three strategic orientations may differ according to a firm's order of entry into an industry.

Following Lieberman and Montgomery's (1998) evaluation of their major contribution on first mover advantage, we emphasize three points. First, we develop and test hypotheses related to early and late followers' strategic orientations, broadening the scope of traditional studies on pioneers. Second, the model combines the dimensions of a firm's age, order of entry, and strategic orientations, as well as industry conditions (stage of the industry, environmental unpredictability, and technology diffusion), to establish a contingent model of performance analysis. Finally, the empirical study deals chiefly with organizational performance and not market share, which is considered a typical advantage accruing to pioneers.

In addition, the scope of the study (582 French manufacturing firms) provides the means to fill a void in empirical studies because it is a broad cross-sectional test on non-U.S. data. The firms are mainly private, small to medium-sized, and single or dominant business firms. Therefore, our assumptions must be understood as particularly applicable to this type of firm.

The results reveal important lessons for practitioners. First, we did not find a first-mover advantage in terms of organizational performance. In addition, pioneers' organizational performance is enhanced by the cost leader strategy—contrary to our assumption emphasizing innovative differentiation for these firms. Second, early followers' performance benefits from innovative differentiation and marketing differentiation. Finally, late entrants developing a cost leader strategy have a significantly higher performance. All groups considered, late followers are the firms most sensitive to environmental uncertainty and age effects.

Our study clarifies the impact of a firm's age and strategic orientations on its performance depending on the firm's order of entry. The implications of these results are particularly relevant for practitioners and entrepreneurs. First, a cost leadership strategy seems to be a guarantee for a pioneer to increase its organizational performance. New ventures should therefore take into consideration the fact that newness and innovative differentiation might not be the best strategic orientations for high performance in the long run. Second, as a second mover, however, developing a superior product and being able to market it efficiently appear to be the enhancing factors of firm performance. Third, for both pioneers and early followers, age does not significantly reduce their performance. However, the longer a firm waits before entering, the greater is the negative effect of age on its performance. This is due to the difficulty of resisting competitive erosion, because pioneers and early followers drive the changes in the industry. The identification of these effects should help managers and stakeholders to make more effective entry decisions to sustain a firm's advantage, leading to better performance and higher probability of survival.   © 2001 Elsevier Science Inc.

INTRODUCTION

Firm performance analysis has traditionally argued that well-conducted strategic orientations (cost leader strategy or differentiation) enable a firm to earn above-average returns (Porter 1980, 1985). Other studies have shown that a firm's order of entry into a market may also be a critical factor in the explanation of firm performance (D'Aveni 1994; Lieberman and Montgomery 1988). However, rather little research on corporate performance has proposed a contingent model of strategic orientations related to a firm's order of entry into a market. This article bridges this gap and relates the explanation of firm performance to a firm's age, order of entry, and strategic orientations.

Although broad theoretical frameworks discuss the competitive advantage and positioning issues in business strategy literature, very little empirical research has combined strategic orientations with the time dimensions of a firm such as age and order of entry into a business (Lieberman and Montgomery 1998). Population ecologists have distinguished the different risks organizations face over their lifetime, but they focus on environmental and demographic effects and often overlook a firm's strategy and order of entry as explanatory variables (Levinthal and Fichman 1988; Barnett and Amburgey 1990; Barron et al. 1994). At the firm level, Quinn and Cameron (1983) proposed an integrated framework to describe the stages of an organization's growth and Kazanjian (1988) studied the problems faced by new ventures over time and the mutual dependency between the stage of growth and the nature of the management problems to be solved. Although these studies represent a subtle attempt to characterize the different risks associated with aging, they do not address the consequences of a firm's order of entry as an influence on performance.

Order of entry has been vividly commented on as a source of firm performance (Lieberman and Montgomery 1988). Especially, the relative advantages and disadvantages of early entry have led scholars to stress the importance of co-specialized assets (Teece 1986) and inimitable resources (Barney 1991) for maintaining a firm's perfor-

mance after pioneering. Many models try to define the conditions of a smart entry (Robinson and Fornell 1985; Lambkin 1988; Lieberman and Montgomery, 1988; Miller et al. 1989; Mitchell 1991). They emphasize the conditions of suvival of the first entrant. However, they do not study in depth the relationships between a firm's performance and its strategic orientations.

In this paper, we bring together these disparate elements in a coherent structure. The impact of strategic orientations on firm performance is assessed in consideration of entry factors. Basically, we consider that pioneers, early followers, or late entrants do not equally benefit from each strategic option—cost leadership, innovative differentiation, or marketing differentiation. Overall, the aim of this paper is to show how time dimensions (age and order of entry) moderate the effect of strategic orientations on a firm's performance.

This paper is divided into four sections. The first section establishes the theoretical background and the assumptions. The second section describes the methodology and is dedicated to the sample, the variables, and the statistical models. The results are exposed in the third section, and a discussion in the last section relates the results to management recommendations and future research perspectives.

THEORETICAL BACKGROUND

Age and Performance: A Contrasted Relationship

The relationship between firm age and firm performance is well documented but presents contrasted results. Some economists use age as a proxy for the experience the firm has acquired in its business (Geroski 1995). Consequently, post-entry performance is positively related to the age of the firm once the firm has survived for a sufficient period of time (Audrestch and Mahmood 1994; Audrestch 1995). Accordingly, in population ecology, age can reduce the probability of demise for a firm that has proven its ability to survive during the initial "liability of newness" period (Hannan and Freeman 1989). Liability of newness characterizes the propensity of new firms to have higher failure rates (Stinchcombe 1965). Levinthal and Fichman (1988) and Bruderl and Schussler (1990) have introduced another relationship, dubbed "liability of adolescence." These authors consider that the probability of failure increases non-monotically to culminate between 5 and 15 years. Afterwards, the long-term benefits of having survived during the turbulent period diminish the risk of failure (Barnett and Amburgey 1990; Baum and Mezias 1992; Barron et al. 1994). In a recent study, age effects point to a strong liability of aging that increases at a decreasing rate (Ranger-Moore 1998). In this case, too, age enhances the likelihood of survival.

However, in dealing with firm performance, some shortcomings offset age advantages. Strong arguments support the view that older firms are more likely than young firms to achieve lower performance on average (Dunne and Hughes 1994). Older firms suffer from ossification of their routines, non-learning processes, blindness, and conservatism, which cause poor performance and decline (Boeker 1997; Szulanski 1996). Therefore, in spite of the inverse relationship between age and survival, scholars agree that, other things being equal, with age a firm's performance diminishes on average (Evans, 1987). Consequently, our first hypothesis states:

    H1: The older a firm, the lower the firm's performance.

Order of Entry and Performance: A Contested Pioneer Advantage

Classically, scholars use three categories when studying a firm's order of entry in a business: pioneers, early followers, and late movers (Ansoff and Stewart 1967; Robinson et al. 1992). In order to fully evaluate the consequences of time dimensions on a firm's performance, the moderating effect of age on a firm's performance has to be compared with the advantages of having pioneered a business. Indeed, even if a pioneer may appear as a relatively old firm in the business it initiated, the pioneer may benefit from appropriating some innovation rents inimitable by its followers (Liebermann and Montgomery 1988).

For the innovator, the relationship between performance and order of entry spawns a dilemma. The pioneer sees high returns if it is successful but bears the risk of a lower likelihood of success than a later entrant. If a firm enters early, it may not be able to recover its entry investment before competitors imitate its products and perhaps even improve them. Conversely, if a firm enters late, it may not be able to imitate successful early entrants before they establish a strong market position (Mitchell 1989). In the former case, prompt initiative is a driver of the young firm's performance. In the latter, the firm benefits from waiting before entry.

To compare the relative advantages and disadvantages of each entry order, Mitchell (1991) suggests distinguishing between business and firm timing. He introduces the "dual clock" distinction. Dual clock refers to the fact that incumbents, even if they enter late, can benefit from resource endowment advantages that are not recorded when considering only one clock for competition. Therefore, the preemption argument has a downside. A firm owning specialized assets must sometimes enter early, not to preempt the market, but to avoid being preempted by rivals that possess complementary assets. At the center of entry–timing issues, then, are questions about protecting the value of core products and of securing the value of complementary assets (Teece 1986). Nonetheless Mitchell (1991) recognizes that the dual clock distinction cannot be applied to every industry. This fits especially with industries where rapid change in technological standards is frequent, like the medical imagery industry.

For more traditional manufacturing industries, theoretical arguments from the barriers to entry literature explain how pioneers can retain higher market shares and earn above-average returns. Pioneers tend to have higher product quality and broader product lines while charging essentially the same price as late entrants (Miller et al. 1989; Robinson et al. 1992). They turn their timing advantage into economies of scale and scope. Accordingly, the bulk of the empirical evidence suggests that early entry leads to better market performance (Tufano 1989; Mascarenhas 1992; Kalyaranam and Urban 1992; Robinson et al. 1992). Urban et al. (1986) found a positive relationship between early order of entry and market share achieved for brands of consumer goods. A pioneering entry strategy has the strongest positive impact on performance, followed by a late entry strategy, according to Lambkin (1988) too. Consequently, we assume that pioneers are able to keep the lead, and benefit from higher levels of performance. Hypotheses 2 follow.

> *H2A:* Relative to pioneering, being an early follower will reduce a firm's performance.

> *H2B:* Relative to pioneering and being an early follower, being a late mover will reduce a firm's performance.

Strategic Orientations and Performance

Further exploring the effects of age and order of entry on a firm's performance also requires focusing on a firm's strategic specificity (Szymanski et al. 1995). Kerin, Varadarajan, and Peterson (1992) argue that strategic orientations are a determinant of a competitive sustainability. According to its timing to market, each firm has to strategically exploit its resources to enhance its competitive position. Lambkin (1988) shows that some variables may equal or surpass order of entry in terms of their influence on a firm's market share: the scale at which a business commences its operations and the competitive strategy it uses to develop its business. Then, following the contingency perspective (Kerin et al. 1992; Szymanski et al. 1995), we argue that every strategic orientation does not affect performance independently of a firm's entry order. This paper explores these relationships in more detail.

Many options are available when characterizing strategy, but the typology introduced by Porter (1980, 1985) is widely used. Porter has distinguished three main strategic orientations. First, firms can compete via their costs of production, to preserve higher margins than their competitors. This cost leadership strategy implies that by doing this firms gain market share and improve their cost structure. Second, firms can choose a differentiation strategy. For instance, they may develop a competitive advantage by gaining customer loyalty either by innovating and upgrading their products or by offering a valued unique image via marketing. Finally, Porter distinguishes the focus strategy, which is the application of either cost leadership or differentiation strategy to more narrowly targeted customers.

In this paper, we follow Miller's criticisms on Porter's typology and adopt his variant (Miller 1986, 1988). Miller posited two types of differentiation to make up for the restricted vision of innovation behaviors suggested by Porter's framework: innovative differentiation and marketing differentiation. Marketing differentiation is based on marketing expenditures and is similar to Miles and Snow's (1978) analyzers. Innovative differentiation is based on innovation and is akin to Miles and Snow's prospectors. These three strategic orientations are observable in other tentative typologies (Robinson and Pearce 1988; Conant et al. 1990). Robinson and Pearce (1988) found five clusters of strategic behaviors, of which the three most significant ones overlap with Miller's classification. Ranking them by level of performance, these authors found that marketing differentiation behavior obtained the best performance ratios, followed by innovative differentiation and a cost leadership strategy.

As previously mentioned, performance should be explained differently, according to the firm's relative entry order, as well as the firm's strategic orientations.

Innovative differentiation will feature pioneers (Miller et al. 1989). Manu (1992) shows that pioneers emerge as the best performers due to their ability to innovate both in the United States and in Europe. In the case of pioneering firms, their propensity to innovate and differentiate their outputs enables them to achieve competitive advantage and performance, but not through cost leadership orientation or marketing differentiation (Manu and Sriram 1996). Pioneers use innovative differentiation to lure customers. In addition, these firms resort to innovative differentiation to try to protect their competitive advantage.

Regarding the marketing differentiation, we expect that this strategy is a discriminating strategy for the early followers. Early followers, after having estimated that the pioneers have incurred the up-front costs associated with entry, decide to enter and

Variables	All firms	Pioneers	Early followers	Late followers
Age H1	- H1	- H1	- H1	- H1
Entry order H2	Pioneer>early follower>late follower			
Cost leadership	+ H3a	n.s.	n.s.	+ H3b
Innovative differentiation	+ H3a	+ H3c	+ H3c	n.s.
Marketing differentiation	+ H3a	n.s.	+ H3d	n.s.
Environmental unpredactibility	- H4a	n.s.	n.s.	- H4b
Emerging market vs. mature	+	+ H5a	n.s.	n.s.
Growing market vs. mature	+	n.s.	+ H5b	+ H5b
Diffusion of the technology	- H6a	Negative effect of technology diffusion greater for pioneers than for followers (H6b)		

FIGURE 1 Expected relationships on performance.

differentiate their own offering through marketing capabilities and additional innovative differentiation (Gatignon et al. 1989). Early followers distinguish their products by adding innovative features to the pioneer's first offering, but, above all, early followers defend their differentiation by devising a good marketing strategy to survive (Bowman and Gatignon 1996). Consequently, early followers, by combining both differentiation strategies are likely to accumulate stocks of these strategic competencies and reduce the pioneer's advantage (Dierickx and Cool 1989; Zhang and Markman 1998).

Finally, the cost leadership strategy must primarily concern the late entrants. For these firms, the competitive aim must essentially involve cost reductions in producing an accepted and standardized product (Utterback 1994; Suarez and Utterback 1995). The late entrants seek to reduce costs, and this strategy characterizes them. The performance of late entrants will be positively impacted by the cost leadership strategy, while pioneers and early entrants' performance will not be affected by this strategic orientation.

Hypotheses 3 follow, and Figure 1 sums up the expected relationships.

H3A: Overall, without any distinction, the three strategic orientations have a positive influence on a firm's performance.

H3B: The cost leadership strategy has a positive impact on late followers' performance and no significant impact on pioneers and early followers' performance.

H3C: The innovative differentiation strategy has a positive impact on pioneers' performance and early followers' performance but no significant impact on late followers' performance.

H3D: The marketing differentiation strategy has a positive impact on early followers' performance and no significant impact on pioneers and early followers' performance.

Environmental Conditions

One of the moderating conditions that should affect performance of firms, according to their entry order, is undoubtedly the uncertainty of the competitive environment, as firms perceive it (Miller 1988; Lieberman and Montgomery 1998). Depending on the firm's characteristics, environmental instability may affect each firm's performance differently (Bantel 1998). Pioneering firms do not suffer from as much organizational inertia as followers do (Hannan and Freeman 1977), and they own specific dynamic resources to succeed. Pioneers do not fear environmental turbulence and may even consider a turbulent competitive environment as a source of opportunities, because of both their bundles of dynamic resources and their proactive behavior (Miles and Snow 1978; Teece et al. 1997). In addition, as innovators, pioneers strive for driving the changes in the industry. As innovation drivers, pioneering firms are very aware of the evolution of the business structure they initiate. For these reasons, we pose that pioneers' performance will not be significantly influenced by environmental uncertainties. On the contrary, the longer a firm waits before entering into a business, the more likely are its new technical and market uncertainties. Hence, it is more likely that late followers' performance will diminish due to environmental uncertainties. Being a late mover reduces the risk of the entry, but increases the likelihood of suffering from unexpected turbulence from the external environment.

> *H4A:* Overall, the unpredictability of the environment has a negative impact on a firm's performance.

> *H4B:* The unpredictability of the environment has a greater negative impact on the late followers' performance than on early followers' and pioneers' performance.

In addition to environmental unpredictability, some authors argue that a firm must match its environmental conditions to be successful (Burns and Stalker 1961; Aldrich 1979). This means that a firm must align its resources and structure with external requirements (Hambrick 1983; Miller and Friesen 1984). According to a firm's entry order, the stage of development of the business should have a differentiated impact on the firm's performance. Economic and managerial literatures agree about the links between performance and the stages of market development. During the first stages of market development, the performance of an early entrant is better, and its risk of mortality and the variance of performance among competitors are higher than those of the followers (Evans 1987; Mata and Portugal 1994). Lilien and Yoon (1990) show that firms who have recently entered the market in either the introductory or the growth stages are likely to obtain greater market performance than elderly incumbents. Entering into an emerging business enables a firm to accumulate resources and competencies that will help the firm fend off followers. Consequently, a firm that enters an emerging market early will have significantly higher performance than a follower. However, in the maturity stage, early and late followers may have some resource advantage over pioneers, because the benefits of preempting the strategic resources becomes less worthy (Lieberman and Montgomery 1998).

> *H5A:* An emerging market will benefit a pioneer's performance more than followers' performance.

> *H5B:* A growing market will benefit followers' performance more than a pioneer's performance.

Finally, although the choice of diffusing the technology falls to the firm, the fact that a technology is widespread through the industry may reduce first-mover advantage. The scarce diffusion of technology contributes to the advantage a firm may build up over time. The specificity of the assets and the exclusiveness of the technology lead to the appropriation of differential rents for the firm (Wernerfelt 1984; Barney 1991). Literature examining technological diffusion indicates that the more diffused the technology the more likely the dominant design has been defined (Utterback and Suarez 1993; Suarez and Utterback 1995), and a highly diffused technology can be related to a relatively poor level of performance for the firms using it. Thus, for technology diffusion, it appears logical to assume that the more diffused the technology used by the firms, the lower their performance. This effect should be particularly significant for pioneers, because a scarce technology is likely to provide the pioneers with idiosyncratic resources and rents.

> *H6A:* Overall, the more diffused a firm's technology, the lower a firm's performance.

> *H6B:* The negative effect of technology diffusion on a firm's performance will be greater for pioneers than for followers.

Figure 1 summarizes the different hypotheses of our model relating age, entry order, and strategy to a firm's performance.

METHODOLOGY

Database

The data used in this research were gathered by the Bank of France, the French central bank in 1996. This information has been gathered annually since 1993 in order to advance the corporate research done by the Bank of France on French companies. In particular, it serves to deepen the links between industrial organization, firm strategy and corporate finance. The data is collected in face-to-face interviews with CEOs, using a computer-aided questionnaire. For this kind of survey, the top manager is considered the person with the most comprehensive knowledge about the firm and its strategy (Hambrick 1981; Miller and Friesen 1984). The questionnaire, largely inspired by the PIMS database, deals chiefly with the following topics: the business environment, the firm's strategy in each of its businesses, the firm's internal organization and management features.

These interviews were conducted by Bank of France agents specially trained in survey techniques. Moreover a user guide has been developed and implemented to foster homogeneity among the surveyors managing the questionnaire. As in the PIMS database, CEOs define their business environment (Buzzel and Gale 1987). Nevertheless, businesses are classified according to the European equivalent of the SIC classification (the NACE). There are therefore obvious shortcomings in such databases, e.g., cross-sectional nature, risk of miscommunication, or problems with measurement of variables (Manu 1992). But the importance of PIMS for research in strategy and management is also widely accepted among academics and practitioners (Venkatraman and Ramanudjan 1987; Scherer and Ross 1990). Despite its limitations, the qualitative database of the Bank of France has begun to be used by academics (Amburgey and Dacin 1997; Cool and Henderson 1998; Durand 1999).

TABLE 1 Breakdown of the Sample by Industries and Groups

	Total	Pioneers	Early Followers	Late Followers
Clothing and leather industries	185	42	74	69
	(31.8%)	(22.4%)	(33.2%)	(36.9%)
Pulp and paper industries	137	31	41	65
	(23.5%)	(18.0%)	(18.4%)	(34.8%)
Pharmaceutical industries	51	19	20	12
	(8.8%)	(11.0%)	(9.0%)	(6.4%)
Home equipment industries	201	80	88	41
	(34.5%)	(46.5%)	(39.4%)	(21.9%)
Total	582	172	223	187
	(100%)	(100%)	(100%)	(100%)

Sample

To limit heterogeneity generated by cross-section studies and to reduce the likelihood of noise introduced by diversification on our hypothesized relationships, we focused our attention on the four industries that had large proportions of nondiversified firms: clothing and leather industry, pulp and paper industry, pharmaceutical industry and home equipment industry. A sample of 931 firms belonging to these industries was surveyed in 1996 by the Bank of France, for which at least 70% of their activity consists of one business. Responses with one or more missing observations were deleted. Surveyors are asked to return a blank rather than an uncertain answer during the face-to-face interviews. This method tends to increase the number of missing responses but existing responses are considered more reliable. Moreover, 52 firms that had undergone recent restructuring were deleted because of high variations in accounting data.

After these operations, the final sample comprises 582 firms. The Bank of France database contains information on mostly small and medium-sized firms, but is representative of the industries studied (Cool and Henderson 1998). The three-year average size of the firms in our final sample turned out to be 165 employees (minimum: 20; maximum: 2,500). Among the 582 firms, 201 (34.5%) firms were in the home equipment industry (which includes furniture production, home appliance production, sports and leisure industries, the optics industry, and jewelry and silver production), 185 (31.8%) in the clothing and leather industry, 137 (23.5%) in the pulp and paper industry, and 51 (8.9%) in the pharmaceutical industry. Table 1 provides details on the breakdown of our sample by industry (presented at the SIC two-digit equivalent) and according to a firm's entry order.

Variables

First, we describe the variables we used from the Bank of France database, and then, we present the results of the empirical tests.

Age

Age is represented by the logarithm of the number of years since the firm has entered the business.

Order of Entry

The scale of the question about the order of entry of a firm in its main business since the last major technological change consists of five items: first; second; third–fifth; sixth–tenth; more than tenth. As previously mentioned, because an industry contains a number of businesses, there is more than one first entrant in an industry. In a business, the first entrant is generally well known as well as the last entrants. In fact, the main difficulty lies on ranking the early followers. Because of timing uncertainty and knowledge imperfection, it is sometimes difficult to identify if the firm entered in the third, fourth or fifth position. In general, CEOs only know they were among the first followers. That is why we reduced the order of entry variable to the three most commonly used categories: pioneer (first position), early follower (from second to fifth position) or late entrant (more than sixth). This solution is consistent with the methodology chosen by the PIMS on that topic (Buzzel and Gale 1987). Without being totally eliminated, the risk of mistake is thus reduced. This seems a good trade-off with a loss in the variance of the scale. Pioneer is the reference in our regression models.

Strategic Orientations

We chose a number of variables describing strategic orientation and performance in the Bank of France survey. Selection was based on a review of literature on similar research (Dess and Davis 1984; Miller and Friesen 1984; Lee and Miller 1996). Because main strategic dimensions are not directly observable, strategic variables are actually measured by multiple scales, whose internal reliability is controlled by the Cronbach alpha (Nunnally 1978). Reliability levels are often poor with secondary data because questions have been elaborated with no specific consideration for the constructs. Despite this possible limitation, the reliability of our constructs does not go under 0.67, which is a very acceptable threshold for such research[1]. We present below the constructs and Appendix 1 gives more details about the selected variables.

Cost leadership is measured by the two items assessing the position of the firm in terms of cost and price vis-à-vis its main competitors. The Cronbach alpha reliability for the cost leadership variable is 0.67.

Marketing differentiation is gauged by five items assessing the propensity of the firm to develop originality, quality and innovation in its product policy, the elasticity of customer demand to differentiation and the impact of the firm's supply on customer sales. The Cronbach alpha reliability for the marketing differentiation variable is 0.69.

Innovative differentiation is reflected in three items concerning the nonimitability of a firm's own products and processes, and its ability to differentiate through its main technologies. The Cronbach alpha reliability for the innovative differentiation variable is 0.70.

Environmental Unpredictability

Corporate performance may be highly influenced by the level of environmental uncertainty and by the dynamics of critical environmental changes. Porter (1980) has identified uncertainty as a major factor altering main strategic decisions. Environmental un-

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[1] A confirmatory factor analysis has been successfully conducted to check the validity of these constructs.

predictability is assessed as the mean of three scale items; these include market foreseeability, strategic planning vision and the perception of skill changes. Consequently, environmental unpredictability is likely to be strong when the market cannot be anticipated, when strategic planning is difficult and when business skills are about to change. The Cronbach alpha reliability for environmental uncertainty is 0.71.

Stage of Market Development

Three possible characterizations are present in our sample: emergence, growth, or maturity of the main business activity. Maturity is the reference in our regression models.

Technological Diffusion

This variable consists of the ratio between the number of rivals that own the same technology as the firm, divided by the number of rivals in the business. The higher the ratio, the more diffused the technology.

Performance

Corporate performance is not often described in detail by academics (Venkataraman and Ramanujam 1986, 1987). It is sometimes identified with profit, and sometimes with market power. Its most common proxies are ROS, ROI and ROA. In this study, instead of measuring corporate performance only with financial or economic ratios, we developed a more complete index, inspired by Lee and Miller (1996). Thus, like these authors, and because strategy involves all dimensions of corporate behavior, we chose an index of organizational performance with a broader range than merely financial ratios. Our variable of organizational performance is measured by five items indicating the profitability, the return on assets, the growth of sales, the growth of margins and the growth of the number of employees. Each item, which is an average value for the 1993–1996 period, is standardized on a five-point scale. The Cronbach alpha reliability for the organizational performance variable is 0.78.

Control Variables

Four variables were included in the model to control the impact of the strategic explanatory variables on performance. Because firm size can affect organizational performance, we had to control for this effect. Firm size is measured by the logarithm of the 1993–1995 average number of employees in the firm. Accordingly, the growth of the market served by the firm might contribute to organizational performance. We therefore introduce a market growth variable, expressed by a percentage growth in the business segment targeted by each firm and corrected by the geographical scope of the market.[2] The degree of competition in the business may affect a firm's organizational performance. The corresponding control variable is the number of firms present in the business. Finally, we introduced the industry dummies based upon the official classification to control for industry effects.

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[2] The question takes into account both the geographical scope of the market (regional, domestic, or international) and the specific business segments really concerned. This concept of served market is similar to the one developed in the PIMS approach (Buzzel and Gale 1987, p. 33).

RESULTS

We estimated the influence of strategic orientations through multiple regression analysis. Because of the restrictive assumptions related to the use of ordinary least squares, we controlled for multicollinearity and heteroscedasticity.

Descriptive statistics

Table 2 shows the descriptive statistics and the matrix correlation for the sample. In general, correlations are moderate and do not violate the assumption of independence between explanatory variables (the higher correlation is 0.40, in absolute value[3]). The positive correlations between strategic orientations and performance, and the negative correlation between environmental variables (diffusion of technology, environmental unpredictability) and performance are congruent with our underlying conjectures. Growth of the market is significantly correlated with our performance index, which seems logical, because, in the performance index, we used three variations that are likely to be found in growing markets.

Upon analyzing the plot of the predicted dependent variable (performance) and the residuals, we did not find evidence of heteroscedasticity (unequal variance of the error term). But, because heteroscedasticity is frequent in cross-sectional studies (Cool and Henderson 1998), we performed weighted least squares on the variables, with size as a weight (Ravenscraft 1983). This method confirmed the results given by the ordinary least square regressions. For reasons of simplicity, they will be presented alone.

The group comparisons of variable means between pioneers, early followers and late followers are provided in Table 3. Interestingly, we observe no significant difference on the level of organizational performance between these groups. However, late followers have been logically present in the business for less time than pioneers and early followers, and for late followers the technology diffusion is significantly greater than for the other groups. Also, late followers evaluate the environment as significantly more unpredictable than pioneers and early followers. Regarding strategic orientations, two results are interesting. First, cost leadership is associated with no group. Second, innovative differentiation strategy is, on average, more relevant for pioneers. These descriptive results provide some preliminary support for several of our assumptions that must be confirmed by our regression models.

Table 4 gives the results of the OLS regression for the entire sample, with and without the influence of the control variables (Models 1–3) and for each group (Models 4–6).

Multiple Regression Analyses on the Entire Sample

Model 1 consists of the strategic explanatory variables alone. Model 2 includes the control variables. Adjusted R^2 is 16% for Model 1 and 22% for Model 2, showing that per se, without control variables, the independent variables explain significantly a firm's organizational performance. Model 3 includes three interaction variables: cost $\times$ late is the interaction between cost strategy and late entry (H3B); inno $\times$ no_late is the interaction between innovative differentiation and first or early entry (H3C); finally, mark $\times$ early interacts marketing differentiation and early entry (H3D).

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[3] Including dichotomous variables (industries), for which correlations are derived from proportions.

TABLE 2 Pearson Correlation

	Mean (s.d.)	Perf	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
a. Age	3.515 (0.815)	**-0.12**															
b. Rk_early	0.383 (0.487)	0.06	0.04														
c. Rk_late	0.321 (0.467)	-0.05	**-0.18**	**-0.54**													
d. Cost leadership	2.940 (0.806)	**0.17**	0.01	0.06	0.01												
e. Innovative differentiation	2.259 (1.02)	**0.18**	0.00	-0.06	**-0.15**	0.03											
f. Marketing differentiation	3.934 (0.75)	**0.13**	-0.04	-0.02	**-0.15**	**-0.11**	**0.28**										
g. Environmental unpredictability	2.895 (0.93)	**-0.16**	-0.03	0.03	**0.12**	-0.06	**-0.15**	**-0.09**									
h. Emerg_stage	0.162 (0.37)	**0.25**	**-0.19**	-0.06	-0.04	0.01	**0.09**	**0.15**	**-0.10**								
i. Growth_stage	0.639 (0.48)	0.01	**0.13**	0.01	0.00	-0.02	0.02	-0.05	-0.07	**-0.58**							
j. Technology diffusion	0.877 (0.32)	**-0.12**	0.01	-0.06	0.07	-0.01	**-0.29**	-0.04	-0.04	0.00	-0.04						
k. Size	4.634 (0.86)	0.00	**0.16**	0.02	**-0.16**	0.00	**0.16**	0.08	**-0.27**	0.04	-0.02	0.01					
l. Market growth	-0.137 (1.47)	**0.34**	-0.05	0.08	-0.08	0.05	0.06	0.05	**-0.13**	**0.31**	0.02	-0.03	**0.09**				
m. Competition	4.332 (0.77)	-0.05	-0.02	0.00	**0.38**	0.02	**-0.20**	**-0.16**	**0.13**	-0.07	-0.01	**-0.22**	-0.04	**-0.09**			
n. Home equipment industries	0.359 (0.48)	**0.10**	0.07	0.06	**-0.20**	-0.04	**0.12**	**0.18**	-0.02	-0.06	0.07	**-0.17**	0.02	-0.03	**-0.12**		
o. Pulp and paper industries	0.235 (0.42)	0.04	-0.01	**-0.10**	**0.18**	0.03	**-0.10**	**-0.27**	-0.06	0.06	0.02	**0.13**	**-0.19**	**0.14**	0.08	**-0.42**	
p. Pharmaceutical industries	0.088 (0.28)	**0.14**	-0.05	0.01	-0.06	0.03	**0.12**	0.01	**-0.15**	**0.18**	-0.06	-0.01	**0.24**	**0.20**	-0.08	**-0.23**	**-0.17**

Note: In bold, coefficient significant at the 0.05 threshold.

TABLE 3   Group Comparison of Variable Means

Variables	Sample Mean	Mean (Pioneer)	Mean (Early Followers)	Mean (Late Followers)	F	Groups[a]
Performance	5.14	5.40	5.56	5.24	1.17	n.s.
Age	3.51	3.69	3.56	3.30	11.77**	[1–2] [3]
Diffusion of technology	3.74	3.22	3.65	4.33	47.12**	[1] [2] [3]
Cost leadership	2.94	2.84	3.00	2.94	1.09	n.s.
Innovative differentiation	2.26	2.59	2.18	2.04	14.59**	[1] [2–3]
Marketing differentiation	3.93	4.13	3.92	3.76	11.07**	[1] [2–3]
Environmental unpredictability	2.90	2.68	2.92	3.06	8.02**	[1] [2–3]
Emerg_stage	0.16	0.22	0.13	0.13	3.02	n.s.
Growth_stage	0.64	0.63	0.64	0.64	0.07	n.s.

** Significant at the 1% threshold.
[a] Groups in brackets have means significantly different at the 0.05 threshold (Duncan and Scheffe tests).

According to H1, age reduces significantly a firm's organizational performance. The coefficient is negative (-0.08) and significant at the 0.05 level. However, although it may appear that being an early follower could increase a firm's performance (Model 1), this result is not confirmed when control variables are included. Overall, H2A and H2B are not confirmed by empirical results. The first mover advantage is not valued by our test.

All strategic orientations have a positive significant influence on firm results. We observe a high stability in the results of Models 1 and 2. The coefficients keep the same values, despite the addition of the control variables. They are significant at least at the 0.05 level, confirming H3A. The test of interaction effects between strategy and entry order provides contrasted results (Model 3). Only the interaction between a marketing differentiation and being an early follower provides the expected results (H3D). Several reasons may account for these mitigated results. First, our hypotheses on cost strategy and innovative differentiation may have gathered distinct groups. For instance, cost strategy may improve not only late mover performance but also pioneer or early follower performance. Second, entry order has consequences not only on strategic orientations but also on other variables (Figure 1) the three interaction variables may not capture. However, multiplying interaction effects creates some multicollinearity problems between the variables used for the interaction and the interaction itself due to the size of our sample (Kennedy 1998). Therefore, we tested our hypotheses by entry order (Models 4 to 6).

Regarding environmental conditions, the unpredictability of the environment consistently reduces the performance of a firm (H4A). Relative to mature markets, emerging and growing markets very significantly increase a firm's performance (at the 0.001 level). Finally, technological diffusion reduces a firm's performance in model 1, but the result does not remain significant when introducing control variables—although the sign of the coefficient is still negative, the T value is only 1.446. Therefore, H6A is not strongly supported by our results.

Models 2 and 3 include the control variables. Market growth contributes strongly to improvement of the organizational performance index. The size of the firm has a decreasing, but not significant, effect on performance. The number of rivals in the indus-

TABLE 4 Multiple Regression Analysis for Performance

	Model 1, All	Model 2, All	Model 3, All	Model 4, Pioneers	Model 5, Early Followers	Model 6, Late Followers
N	582	582	582	172	223	187
Age	−0.083**	−0.078**	−0.078**	−0.074	−0.012	−0.132*
	(−2.095)	(−2.003)	(−1.988)	(−0.947)	(−0.204)	(−1.885)
Rk_early	0.087*	0.068	0.027	—	—	
	(1.860)	(1.441)	(1.283)			—
Rk_late	0.031	0.037	−0.053	—	—	
	(0.636)	(0.696)	−(0.324)			—
Cost leadership	0.160***	0.153***	0.136***	0.223***	0.069	0.205**
	(4.154)	(4.109)	(2.977)	(3.241)	(1.149)	(2.976)
Innovative differentiation	0.095**	0.091**	0.093**	0.092	0.152**	0.017
	(2.230)	(2.142)	(1.977)	(1.132)	(2.177)	(0.218)
Marketing differentiation	0.075*	0.086**	0.037	0.032	0.120**	0.051
	(1.859)	(2.103)	(0.725)	(0.430)	(1.974)	(0.633)
Cost×late	—	—	0.104	—	—	
			(0.723)			—
Inno×no_late	—	—	−0.018	—	—	
			(−0.193)			—
Mark×early	—	—	0.346*	—	—	
			(1.675)			—
Environmental unpredictability	−0.094**	−0.079**	−0.081**	0.019	−0.039	−0.216**
	(−2.358)	(−1.958)	(−2.020)	(0.248)	(−0.627)	(−3.028)
Emerg_stage	0.328***	0.199***	0.199***	0.347***	0.115	0.173*
	(6.717)	(3.833)	(3.827)	(3.250)	(1.428)	(1.925)
Growth_stage	0.209***	0.123***	0.118**	0.127	0.123*	0.080
	(4.394)	(2.572)	(2.442)	(1.294)	(1.653)	(0.940)
Diffusion of technology	−0.077**	−0.060	−0.062	−0.074	−0.051	−0.096
	(−1.965)	(−1.446)	(−1.481)	(−0.905)	(−0.755)	(−1.249)
Firm_size	—	−0.062	−0.062	−0.066	−0.111*	−0.019
		(−1.502)	(−1.517)	(−0.893)	(−1.651)	(−0.255)
Market growth	—	0.214***	0.214***	0.196**	0.311***	0.169**
		(5.123)	(5.125)	(2.593)	(4.564)	(2.248)
Competition	—	0.052	0.010	0.079	−0.030	0.067
		(1.156)	(1.019)	(1.018)	(−0.462)	(0.950)
Ind_Hom	—	0.142***	0.142***	0.173**	0.143**	0.147*
		(3.189)	(3.188)	(1.975)	(2.053)	(1.906)
Ind_Paper	—	0.086*	0.075	0.209**	−0.021	0.053
		(1.847)	(1.608)	(2.408)	(−0.297)	(0.598)
Ind_Pharma	—	0.102**	0.097**	0.173*	0.160**	−0.010
		(2.382)	(2.267)	(1.660)	(2.380)	(−0.125)
Constant	3.602***	3.944***	4.694***	2.207	4.407**	5.026*
	(4.143)	(3.470)	(3.880)	(1.226)	(2.642)	(1.802)
R^2	0.175	0.238	0.243	0.285	0.311	0.242
Adjusted R^2	0.161	0.216	0.218	0.222	0.264	0.180
F	12.125***	11.016***	9.447***	4.479***	6.695***	3.915***

Note: Standardized coefficients and *T* values in parentheses.
Significance levels: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.001$.

try does not clearly alter organizational performance. Finally, it appears that firms in the home equipment industry, pharmaceutical industry, and pulp and paper industry have, on average, better organizational performance than those in the clothing and leather industries.

Multiple Regression Analyses According to Entry Order

To disentangle some unobservable effects through the direct interaction approach (Model 3) as well as to evidence other inter-group differences, we tested our regression models for each entry order. In Model 4, it appears that pioneers benefit remarkably from a cost leadership strategy: the coefficient is equal to late movers' coefficient. This was not anticipated by Hypothesis H3B and may account for the non-significant interaction cost $\times$ late (Model 3). This is not explained by the firm's size, since there is no significant coefficient for firm size in Model 4. Nevertheless, as expected in Hypothesis H3B, late followers are prone to develop strategies based on cost leadership (Model 6). They are more likely to exploit a competitive advantage through cost minimization: the coefficient for cost leadership is high and very significant (0.003). Conversely, and as expected, for early followers, the cost leadership strategy presents a nonsignificant coefficient.

Model 4 presents other salient features. The pioneers' innovative capabilities do not provide them with a sustainable advantage. Innovative differentiation does not arise as a discriminating factor for these firms (contrary to H3C assumption). However, confirming partially H3D, market differentiation does not significantly explain pioneers' organizational performance. Finally, environmental conditions also contribute to the explanation of pioneers' organizational performance. Notably, having pioneered a still emerging market enables pioneers to defend their advantage (H5A). However, the technology diffusion effect on the pioneer's performance is not greater for pioneers as hypothesized (H6B). Among the control variables, market growth significantly results in a higher pioneer's performance (but this variable is significant across groups). Interestingly enough, no differences appear between Model 2 and Model 4 regarding the industry dummies.

Model 5 shows that for benefiting from a second mover advantage and for enhancing performance, innovative differentiation and marketing differentiation are the best strategic orientations. Early followers' performance is significantly improved when using these strategies. These results agree with H3C and H3D. Environmental unpredictability does not affect an early follower's performance, supporting H4B. As formulated in hypothesis H5B, a growing market contributes significantly to the early follower's performance (at the 10% level). Finally, although the age of an early follower does not seem to hamper its performance, the size of the firm reduces significantly its ability to maintain a high organizational performance level (at the 10% level).

As mentioned earlier, late movers' best strategic option is cost leadership strategy. Consistent with the predictions, innovative and marketing differentiations do not contribute to late movers' performance (Model 6). In addition, two other results deserve further comments. First, we found that the organizational performance of both pioneers and early followers is not influenced by the unpredictability of their competitive environment. These firms (especially the pioneers) do not fear market instability because they are the firms that introduce the changes into the competitive environment. By contrast, and as expected, this variable is very detrimental to late movers' performance,

and very significant (coefficient of −0.216, *T* value of 3.0). These firms have the characteristics that result from their weak proactivity on the market. Late entrants use a diffused technology (Table 3) and compete on cost. Second, we noticed that as late followers, these firms have been present a shorter time in the business than former entrants. On average, their age is lower than both other groups' (Table 3). However, it is the only group for which age has a significant negative impact on performance (Model 6). Overall, the older a firm, the lower its performance (Models 1 and 2), but, specifically, age does not seem to affect firms equally according to their order of entry, because only late followers exhibit a significant and negative relationship between age and performance. Finally, the last significant result shows that growth as a market stage of development improves late movers' performance (H5B supported).

DISCUSSION

In the evaluation of their 1988 contribution, Lieberman and Montgomery (1998) invite scholars to make new studies in three directions. First, they encourage scholars to analyze followers' advantages: "we suspect that the potential advantages accruing to followers may be as important as those going to pioneers." Next, they indicate that "more research is needed on the strategic choices that pioneers and followers should make under different environmental conditions." Finally, they mentioned that "empirical tests should be related to profit performance" instead of only market share (Lieberman and Montgomery 1998, p. 1122).

The contributions of this paper unfold along these three lines. First, it offers a theoretical framework that embraces not only pioneers but also followers' advantages. Second, the model combines the dimensions of a firm's order of entry and the firm's strategic orientations so as to establish a contingent model of performance analysis. Finally, the empirical study deals chiefly with organizational performance and not market share. In addition, the scope of the study (582 French manufacturing firms) provides the means to fill a void in empirical studies, since it is a broad cross-sectional test on non-U.S. data. The firms are small to medium-sized, and single or dominant business firms. Therefore, the results must be understood as particularly applicable to this type of firms.

Age, First-Mover Advantage, and Performance

Figure 2 summarizes our results. To grow old has a direct and negative effect on corporate performance. Performance (financial and organizational) is partially driven by age. Young firms will have better outcomes than old firms. However, it appears that the effect of age on performance is particularly significant for late movers. This result can be related to the fact that entering late in a market may prevent the firm from getting a competitive advantage that previous entrants may have created and defended. Consequently, age is even more detrimental to performance when a firm delays its entry in a business. This interpretation gives indirect credit to a first mover advantage—or a least a late mover disadvantage.

However, Hypothesis 2 assumes a first mover advantage that our models have not found (Models 1 and 2). In addition, the three groups of firms are close in terms of organizational performance (Table 3). An explanation for the absence of first mover advantage may lie in the choice of our dependent variable. First mover advantage has been significantly tested when the dependent variable is market share. Some authors

Variables	All firms	Pioneers	Early followers	Late followers
Age	-			- H1
Entry order		✕	✕	✕
Cost leadership	+ H3a	+		+ H3b
Innovative differentiation	+ H3a		+ H3c	
Marketing differentiation	+ H3a		+ H3d	
Environmental unpredactibility	- H4a			- H4b
Emerging market vs. mature	+	+ H5a		+
Growing market vs. mature	+		+ H5b	
Diffusion of the technology	- H6a			

FIGURE 2 Results. *Note*: Only significant results reported. In gray unexpected results.

have advanced that organizational performance[4] may not be as explicitly related to a first mover advantage (Patterson 1993).

Entry Order and Strategy

Briefly, the results support the idea that according to a firm's entry order, the strategic orientations and the position vis-à-vis environmental unpredictability differ. We have tested the various influences of strategic orientations by entry timing in a market for single and dominant-business firms. Cost leadership appears to be significant for late entrants but also—and unexpectedly—for pioneers. The selection bias may provide an explanation for this apparently contradictory result regarding pioneers' strategic orientations. In such a case, this result would indicate that pioneers that survived are those that followed a cost leader strategy. A further inference would lead to the assumption that followers, able to differentiate their offering, have supplanted other pioneers. This deduction finds some support in our empirical results since early followers benefit greatly from innovative differentiation and marketing differentiation. Finally, environmental unpredictability is higher for late movers and detrimental to their performance. These firms have chosen to enter a business where their competitors may be far ahead in fomenting some changes that will diminish their ability to appropriate profits from their activity.

Competitive Clocks and Performance

From the Strategy-Structure-Performance paradigm (Bain 1951), to Porter's analytical framework (Porter 1980), an industry follows a life cycle pattern with immutable phases:

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[4] Our performance indicator combines five elements as mentioned previously. We tested separated models for each of the components without exhibiting any significant advantage for pioneers.

emergence, growth, maturity, and decline. The best competitive positioning should thus be to exploit each stage before exit, in shaping the most appropriate timing between investments and profits. Firms would compete using a single-clock pace, the clock of industry life cycle.

Mitchell (1991) and Mitchell and Singh (1993) have shown in the medical diagnostic imaging industry, that it seems better to delay expansion until first movers have identified unsuccessful paths. The performance and survival expectancy of firms is directly linked to the first clock. But, a second clock (evaluated by a firm's order of entry) has important consequences for a firm's performance. According to Mitchell's studies, our results indicate that a multiple clock is required to really evaluate the impact of age on firm and industry performance. Notably, depending on a firm's age and entry order only some strategic orientations contribute to the firm's organizational performance.

Limitations

The first limitation of our study concerns the use of secondary data. We did not collect the data for this study, but instead used data already available from the Bank of France. This is undoubtedly a constraint, in comparison with ad hoc surveys. However, our study benefits from the high quality of the Bank of France studies inspired by the PIMS' legacy, the pluri-annual plan of survey initiated by the Bank of France, as well as a broader scope in terms of targeted firms than we could have gathered by ourselves.

The second limitation relates to the relevance of CEOs' answers. Researchers suggest cross-evaluating the answers using other methods when possible. Unfortunately, we could not cross-validate the CEOs answers. However, previous studies have shown that subjective data is worthwhile when evaluating general strategic issues and performance (Hambrick 1981, 1983; Venkatraman and Ramanujam 1986). According to Tull and Hawkins (1980), personal interviews are useful in handling complex questions, collecting large amounts of data, and obtaining in-depth information. In addition, Bank of France uses interviewers specially trained to survey management. Face-to-face interviews led by trained interviewers tend to reduce the inconsistency of individual answers (deLeeuw et al. 1995).

Finally, we have to question our study for the presence of a selection bias. Because we do not have data for a longitudinal study (including entries and exits), only survivors are present in our sample. Had we had a longitudinal data set we could have controlled for this time-dependent bias. Accordingly, we do not have information about the bankruptcy rates in the industries studied[5]. In our sample, pioneers have been in their industry for a longer operating period. For this group, the selection process has nearly been achieved. These firms have resisted competitive erosion. This implies that these firms owned some competencies/assets that enabled them to survive for a long period of time. By contrast, we can consider that for the last movers, the selection process is not completed. This selection bias can be partially overcome by correcting our variables using age variance. We have run a WLS model using AGE as a weight. This procedure diminishes the importance of the older firms in the results, namely pioneers on average. However, this correction does not bring about any changes in our previous results. We are inclined therefore to conclude that despite a selection bias, our results are robust.

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[5] Another source of bias could be a self-selection process induced by sample selection, like in the PIMS data (Scherer and Ross 1990, p. 419). Nevertheless, studies on sample representativeness undertaken by the Bank of France have not revealed the existence of the same problem.

Research Agenda on Age, Order of Entry, Strategy, and Performance

This study highlights several possibilities for future empirical research. First, we selected the industries where a high proportion of firms are single business firms. This selection aimed at reducing the indirect effect of diversification on organizational performance on the one hand, and on entry order on the other hand. Indeed, diversification has been considered a driver of firm performance as well as an indicator explaining entry and entry success. Further research combining diversification, entry order and strategic orientation would complete the contingent model we helped define in this paper. In this extension, transfer of capabilities, business coherence, and knowledge management should appear as valuable as first mover advantage arguments.

Second, to discriminate between the relative impacts of the different clocks, we should take into account the competitive dynamics in terms of inter-firm competition. Having a longitudinal data set carefully retracing entry, retaliations, and fending off responses would help link the contingent model developed here to the competitive dynamics literature (D'Aveni 1994; Chen 1996).

Finally, a third path of research could be developed to more precisely determine the strategic implementations done by firms. A process theory of the differences in the bulk of the resources owned by the firms according to their age and entry order has to be formulated, following on one hand Quinn and Cameron (1983) and Kazanjian (1988), and on the other hand the marketing literature (Kalyanaram et al. 1995; Szymanski et al. 1995; Zhang and Markman 1998). Specifically an important question concerns the link between entry order and building and leveraging competencies. Which kind of "newness" is better able to create long term advantages for ventures, product innovations or process innovations? Related to both of these Schumpeterian recombinations, what are the corresponding resources and competencies primarily required for securing a first mover advantage? Basing our reasoning on the resource-based view and on the numerous arguments supporting the importance of pioneering as a key determinant for performance, we would be prone to give priority to product innovation and innovative capabilities. In this view, the most important thing is to pioneer in order to preempt the market, and concurrently, to preserve technology from the firm's imitators. However, this inclination did not find support, since pioneering firms appear to benefit essentially from a cost leader strategy. Therefore, the examination of a hierarchy between entry order and connected competencies warrants additional research.

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APPENDIX.   Questions Issued From the Bank of France Annual Survey

AGE: Logarithm of the number of years since the entry in the industry.
        [Number of years = 1996 − date of entry]

ORDER OF ENTRY
Question: What is the entry rank of your company in its main business?
1. First   2. Second   3. Third–Fifth   4. Sixth–Tenth   5. More than tenth
Pioneer is the 1st entrant; early follower is 2nd to 5th; late follower is 6th entrant and above. Note: the reference for entry is the last major technological change.

STRATEGIC ORIENTATION VARIABLES
1. Cost leadership
What is the position of your firm vis-à-vis your main competitors, regarding:

	very low		similar		very high
a. Prices	1	2	3	4	5
	very low		similar		very high
b. Production costs	1	2	3	4	5

2. Marketing differentiation
a. How is your product policy oriented to

	weak				strong
Originality	1	2	3	4	5
	weak				strong
Quality	1	2	3	4	5
	weak				strong
Innovation	1	2	3	4	5

b. How important is differentiation in your customer's decision making?

	weak				strong
	1	2	3	4	5

c. How important is your supply for your customer's differentiation strategy?

	weak				strong
	1	2	3	4	5

3. Innovative differentiation
a. How difficult is it for your competitors to imitate your products and processes?

	easy				hard
your products	1	2	3	4	5
	easy				hard
your processes	1	2	3	4	5

b. Do you manage to differentiate vis-à-vis your main competitors through your own technologies?

	easy				hard
	1	2	3	4	5

ENVIRONMENTAL UNPREDICTABILITY
a. How long is it possible to design your strategy (in years)?
1 (or less)   2   3   4   5 (or more)
b. How long is it possible to foresee your business evolution?
1 (or less)   2   3   4   5 (or more)
c. To what extent could your market's future developments be forecast?
less than 6 months   6 months–1year   1 year   more than 1 year

STAGE OF MARKET DEVELOPMENT
At what stage in the life cycle is your industry?
1. Emerging   2. Growing   3. Maturity

TECHNOLOGY DIFFUSION
How many companies (you included) owned the core technologies you use in your business?
1. (only you)   2. 2–4   3. 5–10   4. 11–50   5. More than 50