

COMPETITIVE AGILITY:  
A SOURCE OF COMPETITIVE ADVANTAGE BASED ON  
SPEED AND VARIETY

Praveen R. Nayyar and Karen A. Bantel

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**ABSTRACT**

Competitive agility is defined here as a unifying concept encompassing competitive speed and variety. The concept of competitive agility complements existing competitive strategy typologies, yet it is a distinct component of competitive strategy. Contrary to received theory, it is argued that greater competitive agility is not always necessary and, sometimes, can be detrimental to achieving the optimal utilization of strategic resources. Environmental conditions and early- and late-mover considerations affecting the desirability of competitive agility are explored and several propositions are presented.

*Jack be nimble, Jack be swift.*

—(Unknown Nursery Rhyme Author)

*Not bad for a company that two years ago was considered a torpid dinosaur among fleet-footed little predators. (Hewlett-Packard) has turned out a rapid fire*

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Advances in Strategic Management, Volume 10A, pages 193-222.  
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ISBN: 1-55938-850-1

*of new products, cut prices even in markets it dominates, and skillfully exploited new high-volume discount retailers. Meanwhile it has slashed costs, cutting its staff to about 89,000 from 94,000 two years ago.... a series of changes at H-P.... (have) given the company a new nimble touch.... Every time it appears someone is going to catch up they move proactively with new price points or new engineering.*

—(Yoder, 1992)

*This is what the U.S. must do to stay competitive and maintain (its) standard of living.... Make factories "agile."*

—(Port, 1991)

## INTRODUCTION

The need for firms to actively respond to an accelerated, turbulent environment of global competition and technological innovation has been widely noted (see, for example, Kanter, 1989). Honda's crushing defeat of Yamaha in the "motorcycle wars" is often quoted as an example of how an agile competitor beat out a much more powerful adversary. As the quotations above illustrate, competitive agility, or nimbleness, is becoming recognized as an important source of competitive advantage. Consistent with this view, most research on time as a strategic weapon suggests that greater speed in competitive actions is universally desirable (Bower & Hout, 1988; Smith, Grim, Gannon, & Chen, 1991; Stalk, 1988; Stalk, Evans, & Shulman, 1992). Several studies have found that an ability to act quickly in response to environmental and competitive pressures puts a firm in a relatively better competitive position. For example, high decision-making speed in high-velocity environments (Bourgeois & Eisenhardt, 1988; Eisenhardt, 1989; Judge & Miller, 1991), and a rapid response to competitors' actions (Smith et al., 1991) have been found to be positively associated with firm performance.

Moreover, the ability to pursue a variety of competitive actions, such as new product introductions, response to customer needs, and manufacturing improvements, is also a source of competitive advantage (Stalk, 1988). Competitive strategies are often characterized by as many as 22 different competitive dimensions (Dess & Davis, 1984), although different "generic" competitive strategies (Porter, 1980) are thought to be made up of internally consistent subsets of these competitive dimensions. Firms can differ in their relative abilities on each competitive dimension. Ghemawat noted, however, that the sustainability of a competitive advantage is "greatest when based on several kinds of advantages rather than one" (1986, p. 58) and that successful rivals often "react to a particular move by adjusting their entire marketing mix" (1986, p. 53).

This discussion suggests that having both high speed and high variety in competitive actions would always be the most desirable competitive approach.

However, developing and maintaining a capability to act fast entails significant costs that need to be balanced against its potential benefits (Eisenhardt, 1989; Fredrickson & Mitchell, 1984; March & Olsen, 1976; Mintzberg, Raisinghani, & Theoret, 1976). For example, Wernerfelt and Karnani (1987) describe the costs incurred as a result of strategic decisions made too early when high uncertainty in an industry exists. One of Citicorp's biggest follies was the introduction of point-of-sale electronic scanners at checkouts. They cost a total of \$200 million and generated only \$20 million in revenues over six years. Other firms saved millions of dollars by seeing where Citicorp went wrong (Bleakley, 1991). Similarly, developing and maintaining a capability for high competitive variety also entails costs (Bray, Kerr, & Atkin, 1978; Stalk, 1988). For example, high product development, production, and advertising costs result from a strategy of high product variety (Stalk, 1988). Given these costs and possible detrimental consequences, it is necessary to ascertain conditions under which investments in developing competitive speed and competitive variety are desirable.

In this paper, we incorporate competitive speed and competitive variety in a unifying concept we call competitive agility. We identify four competitive agility positions that firms may adopt and then develop an integrative model showing the influence of environmental conditions on the desirability of these positions. Further, we discuss the potential influence of early- and late-mover considerations. We base our analysis on both the decision-making and competitive strategy literatures.

## COMPETITIVE AGILITY: THEORETICAL BACKGROUND

To begin to discuss competitive agility, it is necessary to first provide a context in which this concept should be considered. Thus, in the following paragraphs we briefly discuss initiators versus responders, action variations across firms, and the relevance of the concept to both strategic and tactical actions.

Firms take both offensive and defensive actions in their attempts to gain and sustain a competitive advantage (Porter, 1980). Initiators of competitive actions attempt to improve or protect their relative competitive positions for some finite time period, on the assumption that imitators will experience a significant lag in responding (Nelson & Winter, 1982). In this paper, we take the perspective of an initiator as opposed to that of a responder. We are concerned mainly with the speed and variety of actions needed to deal with environmental and competitive opportunities and threats. Thus, our approach contrasts with and complements that of others such as Chen, Smith, and Grimm (1992) who focus on firms' responses to initiators' competitive actions.

Previous studies focusing on competitive responses have generally not distinguished between responses that were similar to initiators' actions and

those that were different (Chen et al., 1992; MacMillan, McCaffery, & Van Wijk, 1985). A notable exception is Smith et al. (1991) who found a high degree of similarity between initial actions and responses to them. For example, a response to a price change was a price change. In these studies, responses are driven by characteristics of initial actions by competitors. Thus, the study of responses to initial actions is well documented. None of these studies has, however, analyzed characteristics of initial competitive moves driven by environmental and move-order considerations that are the focus of this paper. This is not to suggest that competitive speed and variety are not important for competitive responses. On the contrary, the concept of competitive agility is sufficiently general to be applicable to both initiators and responders. Primarily adopting the perspective of the initiator, however, recognizes that truly sustainable competitive advantages are more likely to arise from competitive actions that *cannot* be similarly responded to by rivals (Barney, 1986; Dierickx & Cool, 1989; Lippman & Rumelt, 1982).

The importance of considering initiators' actions is further emphasized by the resource-based view of the firm that argues that firms are a bundle of unique, rare, and inimitable resources (Barney, 1991; Dierickx & Cool, 1989).<sup>1</sup> From this perspective, competitive agility is a resource stock for a firm. It is created by gradually accumulating the necessary capabilities to act fast and in a variety of ways. This accumulation process proceeds differently within each firm. This implies that firms are likely to develop capabilities for competitive agility based on different resources and, therefore, are likely to act in different ways in response to environmental and competitive pressures. For example, some firms may rapidly develop and introduce innovative new products, while others may make rapid marginal improvements in existing products and display marketing genius in selling them as new. Or, some firms may use their strength in distribution channels and cost positions by making frequent changes in distributor margins and prices. Thus, competitive agility levels vary across firms. Further, since competitive agility derives from rare and inimitable resource stocks, it is difficult for low agility firms to become highly agile.

Consistent with previous research (Chen et al., 1992; Porter, 1980, 1985; Smith et al., 1991), both strategic and tactical actions are included in our concept of competitive agility. Strategic actions are generally thought of as representing much larger commitments than do tactical ones, generally involve high-level managers in the decision process (Child, 1972), and can often signal major reorientations (Tushman & Romanelli, 1985). Tactical actions, on the other hand, generally suggest more minor changes that are consistent with the overall strategic thrust of a firm, requiring the input and direction of lower-level managers.

We view competitive agility as an attribute of firms. Consistent with the resource-based view of the firm, competitive agility is a systematically developed distinctive resource that can provide a sustainable competitive

advantage. Although it has been suggested that firms may acquire rare and inimitable resources through serendipity (Barney, 1986), more recently such resources have been seen as developing through deliberate actions taken by firms (Amit & Schoemaker, 1993; Hamel & Prahalad, 1993; Peteraf, 1993).

### Competitive Speed

Competitive speed refers to how quickly a firm acts in the face of environmental and competitive pressures. It is a function of the capability to act fast; a higher competitive speed implies a lower time to act. Time has recently been recognized as an important strategic weapon (Bower & Hout, 1988; Smith et al., 1991; Stalk, 1988; Stalk et al., 1992). Under this perspective, firms that act quickly are likely to achieve superior performance. "As a strategic weapon, time is the equivalent of money, productivity, quality, even innovation" (Stalk, 1988, p. 41). Bower and Hout (1988) and Schmenner (1988) suggested that developing the capability to reduce cycle time in all aspects of a business is crucial to competitive success because it permits "fast firms" to provide greater value to their customers through reduced delivery times, rapid responses to changing customer needs and other competitive conditions, and by improving the quality of organizational processes. Several authors have examined the effects of rapid strategic decision making processes, concluding that speed does relate to superior firm performance (Bourgeois & Eisenhardt, 1988; Eisenhardt, 1989; Judge & Miller, 1991). Similarly, Smith et al. (1991) and Smith, Grimm, Chen, and Gannon (1989) found that responding quickly to a competitors' actions is positively associated with firm performance. The presence of early-mover advantages would also suggest the need for greater competitive speed (Lieberman & Montgomery, 1988).

Developing and maintaining a capability for competitive speed, which can then be exercised when appropriate, also entails some costs. Financial costs may arise from any excess capacity set aside to provide a rapid deployment capability. In the interest of making quick strategic decisions, errors may also arise from a lack of breadth in the generation and evaluation of alternatives (Eisenhardt, 1989; Fredrickson & Mitchell (1984). Other costs may arise from fast decision speed. Fast decision speed may decrease decision quality because (1) it creates a need for centralization (Vroom & Yetton, 1973), (2) it precludes inclusion of a variety of decision makers (March & Olsen, 1976), and (3) it discourages conflict (Mintzberg et al., 1976).

For example, one industry observer noted that at Du Pont "some divisions spend about three times as much money and effort on debugging new products—ironing out problems after the product is launched—than the top new product development companies in the U.S." (McMurray, 1992, p. A1). Istvan (1992) noted that, contrary to expectations, advanced technology installed at many companies to increase throughput (i.e., the output of a

resources are limited, efforts to undertake a variety of actions may result in inadequate resource allocations to any one action, thereby raising the risk of a high competitive variety firm being overwhelmed by more narrowly focused rivals.

### Competitive Agility

As discussed above, we have suggested that competitive speed and variety are two independent dimensions that comprise competitive agility. Some firms can act quickly; some only slowly. Some firms are versatile in that they can take a variety of actions; others can take only a few.

An example that illustrates both aspects of competitive agility is Honda's phenomenal success in the "motorcycle wars" with Yamaha. In response to Yamaha's announcement that it was building a new factory, which would make it the world's largest motorcycle manufacturer, Honda cut prices, flooded distribution channels, and boosted advertising expenditures. Honda further introduced or replaced 113 models of motorcycles over a period of 18 months. Yamaha, in contrast, was able to change only 37 models during the same time. These actions devastated Yamaha. Honda met the unique needs of every customer segment, generated excitement and attention in the market, and established an unchallenged image of being an innovative firm. Thus, Honda's spectacular success, which it sustains to this day, is attributable partly to the high variety of actions it took and partly to the high-speed of its actions.

Similarly, Matsushita Electric's success in video tape recorders is the result of both high competitive speed and variety. Among U.S. firms, perhaps Hewlett-Packard, Microsoft, and Intel come closest to being highly agile competitors. A recent *Business Week* article chronicled Intel's competitive actions and intentions that demonstrate its capability for competitive variety and speed (Hof, 1992). For example, highlighting the variety of actions that Intel is taking, the article noted that Intel "is striking back on multiple fronts, hauling cloners to court, slashing prices as never before, and for the first time, advertising... its chips on TV" and CEO Andrew Grove "vows to fight with everything we've got" (1992, p. 87). Suggesting Intel's commitment to competitive speed, Grove stated that "speed is the only weapon we have" (1992, p. 87) and that "the more people nip at our heels, the faster we go" (1992, p. 94). These actions are consistent with Ghemawat's view that "to create a sustainable advantage, you must either be blessed with competitors that have a restricted menu of options or be able to preempt them" (1986, p. 58). In other words, a firm can create a sustainable competitive advantage by developing a wide menu of options and a capability of acting faster than its competitors.

As depicted in Figure 1, we suggest that the two dimensions of competitive agility, speed and variety, are independent. Although both speed and variety are continuous dimensions, for simplicity we conceptualize four competitive

agility positions corresponding to the four quadrants in Figure 1. Drawing from research in systems theory and population ecology, the quadrants have been labeled slow specialist, fast specialist, slow generalist, and fast generalist. For example, a firm might choose to develop the capability to act fast in only one (e.g., price changes) or relatively few ways (e.g., price changes and price promotions); this firm would be a fast specialist. Others might make a deliberate decision to act slowly, yet in a variety of different ways; these firms would be labeled slow generalists. As will become apparent from our analysis of environmental influences affecting the desirability of competitive agility, the optimal competitive agility position for a firm might feasibly be in any of the quadrants.

It is also important to recognize that an assessment of the extent of a firm's competitive agility, that is, the quadrant to which a firm belonged in Figure 1, would measure speed and variety of action compared to other firms in the referent industry. For example, high competitive speed in the microcomputer industry has a very different meaning than in the steel industry. Consistent with this view, Smith et al. (1989, 1991) and Chen et al. (1992) restricted their empirical analysis of response time to competitors' actions to a single industry. Further, Eisenhardt (1989) and Bourgeois and Eisenhardt (1988) also studied the impact of decision-making speed in a single industry.

### Competitive Agility and Competitive Strategy Typologies

It is useful to compare and contrast the concept of competitive agility with the two most common competitive strategy typologies—the Miles and Snow (1978) and the Porter (1980) approaches. The concept of competitive agility differs in its emphasis on speed of actions from both the Miles and Snow and Porter typologies. Porter's (1980) typology of cost-leadership, differentiation and focus competitive strategies does not consider speed of actions. With regard to the Miles and Snow approach, Prospectors are thought to enact a more dynamic environment and to emphasize innovation (Miles & Snow, 1978). Although this might imply quicker action, none of the empirical studies measuring the Miles and Snow (1978) typology explicitly measures the speed of actions (e.g., Hambrick, 1983a,b; Segev, 1987a,b, 1989; Zajac & Shortell, 1989). Thus, two firms taking similar strategic actions, yet with one clearly implementing these actions more quickly, would both be evaluated as Prospectors. When compared to Defenders, however, we would generally expect Prospectors to act more quickly. This is supported by Segev's (1987a,b) finding that Prospectors were more highly associated with Mintzberg's (1973) Entrepreneurial mode of strategy-making than were Defenders.

With regard to variety of actions, Prospectors would be expected to have expertise in product research and development, market research, and advertising as they seek to maintain a broad product and market domain;

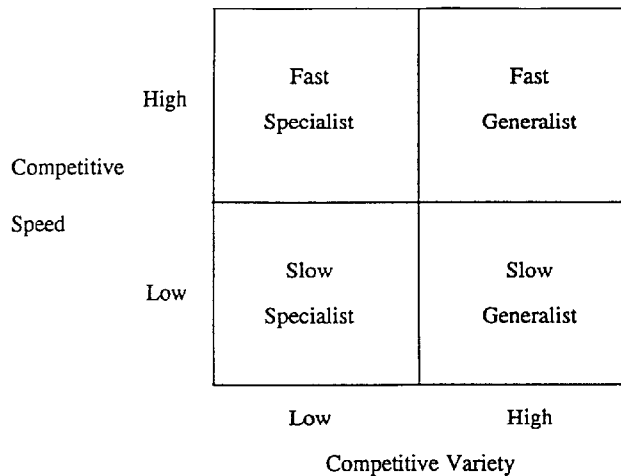


Figure 1. Dimensions of competitive agility.

Defenders would generally have strengths in distribution, technological efficiency, and quality as they concentrate on producing a limited set of products for a narrow product-market segment. Porter's (1980) differentiation firms would tend to excel in the same general areas as would Prospectors, while those pursuing a cost-leadership strategy would overlap with Defenders (Govindarajan, 1986; Hambrick, 1983a,b; Porter, 1980; Segev, 1989). The extant perspective on generic strategies emphasizes a sustained exclusive commitment to one of the strategy types in order to achieve competitive success. Porter noted that "achieving differentiation will imply a trade-off with cost position if the activities required in creating it are inherently costly" (1980, p. 38). In addition, implementing the three generic strategies requires different resources, skills and organizational arrangements.

These descriptions of competitive strategies do not discuss variety in competitive actions within each strategy. But, firms could vary in the dimensions that each chooses to, or can, emphasize. For example, a firm could be a low-cost producer if it has a significant cost advantage in, for example, only one stage of the value chain and have cost parity with its competitors at other stages. In contrast, another firm could seek a low-cost position with cost advantages in multiple stages of the value chain. The latter firm would

be considered to have a higher degree of competitive variety than the former. Similarly, a firm following a differentiation strategy could differentiate only its product while another firm could differentiate not only its product but also its after-sales service, its guarantees, and its credit terms. Again, the latter firm would be considered to have a higher degree of competitive variety than the former. Thus, an important aspect of competitive variety is that, given the pursuit of one strategy type, firms can explicitly choose the number and variety of strategic dimensions that they emphasize.

Another aspect of our meaning of competitive variety is consistent with more recent work in the strategy typologies, which suggests that the simultaneous pursuit of multiple strategy types might be feasible and desirable. Porter noted that in some industries "differentiation may not be incompatible with relatively low costs and comparable prices to those of competitors" (1980, p. 38). Many others have also shown conceptually (Hill, 1988; Karnani, 1984; Murray, 1988) and empirically (Hall, 1980; Miller & Friesen, 1986a,b; Phillips, Chang, & Buzzel, 1983) that low-cost and differentiation are not mutually exclusive strategies. A number of authors have suggested that it is, perhaps, appropriate to consider low cost and differentiation not as polar opposites but as underlying dimensions of competitive strategies (Dess & Davis, 1984; Hambrick, 1983a,b; Jones & Butler, 1988; Karnani, 1984; Miller & Friesen, 1986a,b; Miller, 1988). Firms could thus choose to position their products at different points on both dimensions, simultaneously exhibiting features associated with both strategies. Those activities along the value chain that neither contribute to nor detract from a differentiated position in the marketplace could quite easily pursue low-cost objectives and vice versa.

Segev (1989) compared Porter's (1980) strategies with the Miles and Snow (1978) typology. He found that the Prospector strategy was similar to a differentiation strategy; the Defender strategy was more like a cost-leadership strategy; the Analyzer strategy was more like a combination differentiation and cost-leadership strategy; and the Reactor strategy was more like a firm that was stuck-in-the-middle. Thus, given these similarities, Analyzers could be expected to be capable of higher competitive variety than both Prospectors and Defenders. However, Reactors could also exhibit attempts at moderate levels of competitive variety but are, by definition, expected to be slower in taking actions. Further, Reactors would be unlikely to be as successful as Analyzers at developing a capability for high competitive variety although their actions may suggest attempts to do so.

A further distinction between the concept of competitive agility and the strategy typologies relates to the four competitive agility positions represented by the four quadrants in Figure 1. Neither of the strategy typologies is consistent with the fast specialist or the slow generalist quadrants. Yet, we will show in the following section that these two competitive agility positions are desirable under certain environmental conditions.

In summary, the concept of competitive agility, with its explicit consideration of both speed and variety of competitive activities, complements competitive strategy typologies. For any single or multiple competitive strategy(ies) pursued, firms could adopt any competitive agility position. Thus, we suggest that it is best to consider competitive agility as an aspect of any competitive strategy; it takes into account the variety of strategic activities while considering the speed with which these activities occur. It is not a substitute for competitive strategy.

### INFLUENCES ON THE DESIRABILITY OF COMPETITIVE AGILITY

Having defined competitive agility and compared and contrasted it with the common strategy typologies, we turn now to determine conditions under which particular competitive agility positions would be desirable. Two influences on the desirability of particular competitive agility positions are depicted in Figure 1. The first is environmental conditions, including competitive opportunities and threats, because it is a key focus of the initiating firm in influencing its strategic actions. As discussed earlier, this is in contrast with responding firms which focus on taking competitive action based on specific initial moves made by rivals.

The second influence we consider is move-order advantages. Move-order advantages are associated with the temporal order of competitive moves made by rivals. Given the inclusion of competitive speed in the concept of competitive agility, it follows that advantages generally associated with being an early- or late-mover will be relevant in determining the desirability of particular competitive agility positions. Thus, they are an integral part of the framework developed here.

#### Environmental Influences

The task environment of a firm has a key influence on its performance and viability (Dess & Beard, 1984; Starbuck, 1976). The industry (industries) within which a firm operates is generally the unit of analysis in defining the task environment. Based on the work of Starbuck (1976) and Aldrich (1979), Dess and Beard (1984) identified three key independent dimensions of a firm's task environment. Consistent with the view that environment influences competitive strategy (Burns & Stalker, 1961; Dess & Beard, 1984; Hambrick, 1983a; Miller & Friesen, 1984; Miller, 1988), we examine the influence of environmental munificence, dynamism (turbulence and instability), and complexity on the desirability of specific competitive agility positions. We treat these dimensions as generally independent based on the empirical evidence. A variety of authors

have found either nonsignificant correlations among environmental dimensions (Baucus & Near, 1991; Keats & Hitt, 1988; Wholey & Brittain, 1989) or sufficiently low significant correlations such that the study authors treated the dimensions as independent variables in their further statistical analyses (Baucus & Near, 1991; Keats & Hitt, 1988).

#### Environmental Munificence

Munificence indicates the extent to which the industry environment of a firm is able to support continued growth (Aldrich, 1979; Starbuck, 1976). High munificence suggests the existence of a buffer between a firm and its environment, enabling the accumulation of slack resources (Cyert & March, 1963) that facilitate organizational stability (Bourgeois, 1981). Further, a low degree of competition, which has been found to be highly correlated with industry profitability (Weiss, 1974), is considered indicative of a munificent environment. Consistent with this view, Dess and Beard (1984) used industry sales concentration as an indicator of the level of environmental munificence.

Top managers can exercise high strategic discretion in munificent environments as there is no urgency to respond to environmental developments (Hambrick & Finkelstein, 1987). Greater competition would seem to suggest the need to be particularly fast lest any strategic advantages be lost due to being a late-mover. Conversely, the absence of significant competition would suggest that competitive speed is unlikely to be advantageous (Mitchell, 1989; Scherer, 1980).

Given that a munificent environment is one in which there are ample opportunities to exploit, and slower actions can be taken with no negative effects, a slow approach would be optimal. Greater information processing, flexibility, and creativity in the strategic decision making process, and potentially higher decision quality, can be encouraged. In contrast, environmental threats, which imply a lack of munificence, lead to decreases in information processing (Staw, Sandelands, & Dutton, 1981), and rigidities in decision processes (Yasai-Ardekani, 1989). Further, with a slow approach the costs associated with developing and maintaining high competitive speed can be avoided as lower levels of resources are applied to the strategic decision-making and implementation process. Such cost containment strengthens a firm's competitive position.

**Proposition 1.** *Ceteris paribus, the greater the environmental munificence the lower the need for competitive speed.*

High competitive variety would also be unnecessary in a munificent environment. A firm could realize sustained growth by focusing on a few opportunities, such as a narrow product market domain using a limited number

of competitive approaches. Again, by avoiding the costs of developing and maintaining high variety, a firm will be in a more advantageous competitive position.

An industry characterized by a monopoly is, by definition, a highly munificent environment. Therefore, a monopolist has no need to develop a high competitive variety unless it is threatened by entry into the industry. If a monopolist does develop the capability for a high competitive variety, it will only incur the costs of variety without any benefits. Similarly, in a highly competitive industry in which competition is based on price alone, high competitive variety is unnecessary. Only in an oligopolistic industry will a firm need to develop multiple sources of competitive advantage therefore suggesting the need for high competitive variety. Thus, competitive variety is likely to exhibit a U-shaped relationship with the degree of industry concentration, which is a measure of environmental munificence (Dess & Beard, 1984). Notice, however, that the relationship between the need for competitive variety and environmental munificence is likely to be monotonically decreasing.

**Proposition 2.** *Ceteris paribus*, the greater the environmental munificence the lower the need for competitive variety.

Combining Propositions 1 and 2 yields the optimal competitive agility position for a firm in a munificent environment (see Figure 1).

**Proposition 3.** *Ceteris paribus*, the greater the environmental munificence the more optimal is a slow specialist competitive agility position.

#### *Environmental Dynamism*

The dynamism construct focuses on the issue of environmental change. As described by Dess and Beard (1984), several authors have contended that there is an important difference between the rate of environmental change, or turbulence, and the unpredictability of environmental change, or instability (Duncan, 1972; Jurkovich, 1974; Miles, Snow, & Pfeffer, 1974; Wholey & Brittain, 1989). Both are expected to have an important, and independent, influence on the desirability of particular competitive agility positions.

*Environmental turbulence.* Environmental turbulence is a function of the rate of environmental change. When environmental turbulence is high, firms must act quickly to benefit from opportunities and defend against threats. Bourgeois and Eisenhardt, who defined high-velocity environments as "those in which there is rapid and discontinuous change in demand, competitors, technology and/or regulation" (1988, p. 816), noted that greater decision speed is desirable in such high-velocity environments.<sup>2</sup> Eisenhardt's (1989) study of

decision speed in such environments found a positive association between decision speed and firm performance. To extend the relationship between decision speed and firm performance, Judge and Miller (1991) evaluated that link in high-, medium-, and low-velocity environments. Based on Eisenhardt's (1989) work, they hypothesized that decision speed would be positively associated with financial performance only in high-velocity environments. Their findings supported this hypothesis.

**Proposition 4.** *Ceteris paribus*, the greater the environmental turbulence the higher the need for competitive speed.

The level of environmental turbulence does not influence the need for competitive variety. Thus, given Proposition 4, the particular competitive agility position that is indicated (either fast specialist or fast generalist) would be determined by other factors such as some of the other environmental dimensions discussed in this paper. This broader issue of the simultaneous effects of multiple environmental dimensions on indicated competitive agility positions is discussed at length later.

*Environmental instability.* Environmental instability is a function of the unpredictability of environmental change. In an unstable environment, acting quickly as change unfolds allows firms to take advantage of sudden opportunities and defend against sudden threats. Smith et al. (1989), who defined environmental instability as a composite of the unpredictability of change in terms of activities of key competitors, impact of key competitors, tastes and preferences of customers, rates of innovation, industry downswings and upswings, and diversity of production methods and marketing tactics, found that instability was positively related to response speed. Further, Eisenhardt's (1989) and Judge and Miller's (1991) studies concluded that rapid decision speed was linked to firm performance for firms in high velocity environments, in which higher instability is one aspect. Finally, Romanelli (1989) found that start-up firms pursuing an aggressive strategy, defined as moving quickly to acquire and control as many resources as possible, were more likely to survive to age five; the environments of these start-ups were characterized by a high degree of change, and thus uncertainty, in market demand.

**Proposition 5.** *Ceteris paribus*, the greater the environmental instability the higher the need for competitive speed.

Greater competitive variety is also desirable in the presence of instability. When several future states of the environment are likely, firms that are prepared to deal with several states are likely to achieve a greater "fit" with the unfolding

environment compared with those firms that are not so prepared. Research in systems theory (Ashby, 1956), population ecology (Hannan & Freeman, 1977) and competitive strategy (Wernerfelt & Karnani, 1987) suggests that the best course of action for a firm subject to unpredictability is to achieve the ability to survive in a wide variety of environments. Lambkin (1988) offered some support for these ideas. In a study of new business ventures based on PIMS data, she found that generalist firms (i.e., those with wide product lines, extensive market distribution network, and a large production capacity) were more likely to exist during times when the environment was unpredictable. Further, such generalists outperformed specialists (i.e., those with a narrowly focused product, market, and production profile) over the long term.

**Proposition 6.** *Ceteris paribus*, the greater the environmental instability the higher the need for competitive variety.

Combining Propositions 5 and 6 yields the optimal competitive agility position for a firm facing high environmental instability (see Figure 1).

**Proposition 7.** *Ceteris paribus*, the greater the environmental instability the more optimal is a fast generalist competitive agility position.

#### *Environmental Complexity*

Environments are not, by their nature, unidimensional. Environmental complexity refers to the range and variety of environmental elements pertinent to strategic decision making (Child, 1972; Duncan, 1972). Environments can be conceived of along at least five dimensions: social, technological, economic, political, and competitive. Each of these dimensions is, in turn, comprised of many underlying elements. For instance, the competitive environment comprises the number and size distribution of competitors, the ways in which they compete, and the goals that they pursue.

High environmental complexity necessitates paying attention to a broader range of competitive issues (Aldrich, 1979). Dess and Beard (1984) suggested that firms face higher environmental complexity when they compete in industries that use many inputs and produce many outputs. Under these conditions, firms would need to match this environmental variety in their own competitive activities. Further, we suggest that even for any one product market, environmental complexity can vary widely. For instance, for commodity products, where price is generally the sole determinant of market share, firms must have the capability to act quickly with respect to that single dimension by adjusting prices rapidly as required by the market. In the industries for well-established consumer nondurable goods, such as bath soap, both price and product features determine competitive success. Hence, firms

must have the ability to act on both of these dimensions. In the automobile market, firms must be able to compete on the dimensions of pricing, styling, technology, and financing.

In a manner similar to the structural variety that firms undertake to reflect their environment, firms must also undertake the requisite variety of competitive actions. As environmental complexity increases with more inputs and outputs, and due to the nature of the product, a greater variety of competitive actions is desirable.

**Proposition 8.** *Ceteris paribus*, the greater the environmental complexity the higher the need for competitive variety.

The level of environmental complexity does not influence the need for competitive speed. Thus, given Proposition 8, the particular competitive agility position (either slow generalist or fast generalist) would be determined by other factors such as some of the other environmental dimensions discussed in this paper. As noted earlier, this issue is discussed in detail later.

#### Early and Late Mover Considerations

Early and late mover considerations are a further important influence on the desirability of the four competitive agility positions (see Figure 1). With regard to the competitive speed dimension, the issue of potential early-mover benefits is an important consideration. Lieberman and Montgomery (1988) provided a comprehensive review of the mechanisms leading to move-order advantages. They suggested that first-mover advantages are endogenously generated through a multistage process beginning with some initial asymmetry that enables a firm to gain a head start over its rivals. Next, a variety of mechanisms allow the firm to exploit its position. These are: technological leadership, preemption of assets, and buyer switching costs. First-mover disadvantages provide opportunities for late-mover advantages (Lieberman & Montgomery, 1988, 1991).

Leadership in technology offers advantages if significant learning curve benefits or patent protection for new technologies exist that allow pioneering firms to appropriate economic rents from their R&D efforts. The preemption of existing assets such as input factors, locations in geographic and product attribute space, and productive capacity acts as a significant entry barrier for later entrants. Such entry barriers provide early-movers with the opportunity to extract monopoly economic rents. The presence of significant buyer switching costs protects early-movers from attempts by later entrants to woo away customers. Such costs might arise for a number of reasons including investments made by buyers in initial choice decisions, investments in complementary assets or skills, and "membership" relationships created by

sellers. Brand loyalty also contributes to switching costs for buyers because changing brands creates avoidable stress for buyers. Thus, consistent with this literature, it appears that greater competitive speed is desirable when there are early-mover advantages.

These early-mover advantages notwithstanding, some research suggests that there are differences in the costs that early- and late-movers incur. For instance, it has been observed that late-movers have lower costs and take less time compared to early-movers in product and process innovations (Levin, Klevorick, Nelson, & Winter, 1987; Mansfield, Schwartz, & Wagner, 1981). One explanation offered for these results in the context of new market entry by fast followers is that they had the requisite specialized complementary assets such as service and distribution systems and reputation already in place (Mitchell, 1989; Scherer, 1980; Teece, 1986). Late-movers also may gain advantages from "free-riding" on investments made by early-movers, from the resolution of technical and market uncertainty, from new opportunities due to technological discontinuities, and from the inertia of incumbents to adapt to environmental change (Lieberman & Montgomery, 1988, 1991).

Further, among late-movers too it has been found that fast followers gain greater market shares than late followers although the data on profitability differences are mixed (Lieberman & Montgomery, 1991). Thus, competitive speed could also be needed for those firms that have chosen to follow rather than to be early-movers. It appears, therefore, that the need for competitive speed does not vary with move order. Among firms aspiring to be early-movers, greater competitive speed is desirable; similarly, among firms aspiring to be late-movers, or followers, greater competitive speed is also desirable.

**Proposition 9.** *Ceteris paribus*, the greater the move-order advantages, the higher the need for competitive speed.

When would competitive variety be useful? From the perspective of a late-mover facing an established incumbent, competitive variety offers a way to avoid head-to-head competition, thereby possibly offering an opportunity to coexist in the market place. Through competitive variety, a late-mover can compete on a basis different from the incumbent and adopt a less-visible strategy that is unlikely to draw the attention and response of the incumbent (Lieberman & Montgomery, 1991). MacMillan et al. (1985) suggested that visibility, perceived potential, and strategic significance of competitive actions is associated with rapid response to competitor actions. Smith et al. (1989) also found that actions by competitors that are perceived to be threatening are associated with shorter response times from competitors. A less-visible and perceived nonthreatening competitive strategy that does not directly take on an established incumbent is likely to attract reduced attention from incumbent firms and a slower, if any, response. This would permit the late-mover time

to gain a foothold in the market. Hence, the ability to undertake a variety of competitive actions, especially those that are based on a different competitive logic than that of competitors, might permit late-movers to gain an advantage over incumbent firms. A good example of such a strategy is provided by Michelin's low-key entry into the Canadian market as a prelude to a low-key attack on the more profitable, rapidly growing, and larger U.S. market for tires. Other examples are the initial entry of Japanese automobile and copier manufacturers into the low-end of the respective U.S. markets, and Wal-Mart's regional geographic niche strategy that avoided the markets of other much larger and established retailers.

Apart from the advantages of not attracting attention from, and gaining an advantage over, incumbents, greater competitive variety also permits the pursuit of multiple sources of competitive advantage. Porter (1985) suggested that although the simultaneous pursuit of both a low-cost and a differentiation strategy can be organizationally problematic, successful implementation of such a strategy offers firms a considerable sustainable competitive advantage. Ghemawat (1986) and Ghoshal (1987) echoed this view.

**Proposition 10.** *Ceteris paribus*, higher competitive variety provides firms with opportunities for late-mover advantages.

Although arguments supporting a positive relationship between competitive speed and firm performance in high-velocity or turbulent environments are persuasive (see Proposition 4), a further examination based on the literature on early-mover advantages is instructive. Since high-velocity environments are characterized by many rapid changes, opportunities to "leapfrog" competitors are also greater since "technological discontinuities can provide gateways for late entry...because pioneering incumbents are often caught off-guard" (Lieberman & Montgomery, 1991, pp. 21-6). Hence, the likelihood of sustaining a competitive advantage by being a one-time early-mover in such environments is low. In other words, a fast late-mover could "leapfrog" the early-mover. Thus, an early-mover in a high velocity environment must develop and sustain the capability to always be an early-mover. It must be consistently innovative because otherwise a fast late-mover might seize the advantage. As Lieberman & Montgomery noted "the only way that later entrants can erode the pioneer's first-mover advantages is if the pioneer provides the opportunity by failing to at least match the later entrants" (1991, pp. 21-7). But, when environmental turbulence is high there will be many opportunities to regain the lead unless, of course, there are significant advantages to being the leader at every stage. In the absence of such cumulative leadership advantages, it is not necessary for a firm to be an early-mover at every stage of development because achieving a consistent lead in innovation is extremely difficult and often costly while imitation is both faster and cheaper (Mansfield et al., 1981).

**Proposition 11a.** *Ceteris paribus*, the greater the environmental turbulence, the lower the need for competitive speed when there are late-mover advantages and a firm is unable to always be an early-mover.

Conversely, in relatively less turbulent environments, where changes are few and occur slowly, there are few opportunities to “leapfrog” an existing leader. In such cases, there is a greater likelihood of sustaining a competitive advantage obtained by being an early-mover as the next opportunity to “leapfrog” is likely to be far away. In this case, an opportunity exploited is likely to result in a long-lived advantage (Lieberman & Montgomery, 1991).

**Proposition 11b.** *Ceteris paribus*, the lower the environmental turbulence, the higher the need for competitive speed when there are early-mover advantages.

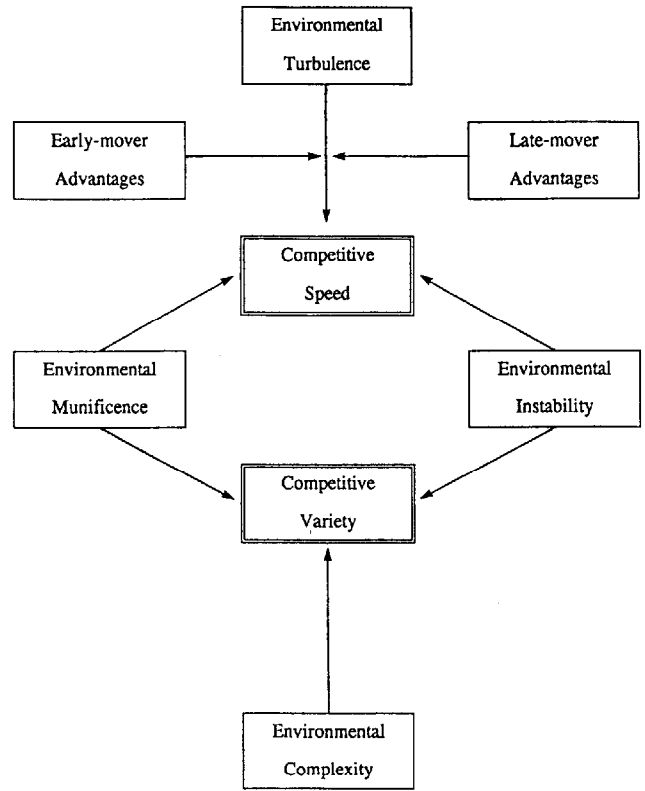
Thus, we expect that the extent of both early-mover and late-mover advantages will moderate the relationship between environmental turbulence and competitive speed.

Summary

The basic relationships suggested by our analysis are summarized in Figure 2. In this paper, we offered the concept of competitive agility as another important aspect of competitive strategy. We examined environmental influences on the two dimensions of competitive agility—speed and variety—to develop propositions on when particular competitive agility positions are indicated. In addition, we considered the effect of move order advantages. Next, we consider the simultaneous effects of multiple environmental dimensions.

**SIMULTANEOUS EFFECTS OF MULTIPLE ENVIRONMENTAL DIMENSIONS**

Although we have shown that each competitive agility position is uniquely indicated when a particular environmental condition obtains, it is useful to consider the case when more than one of the four environmental dimensions we examined are simultaneously salient. In the case of an environmental condition to which a firm can respond with slow speed and/or low variety being combined with one requiring fast speed and/or high variety, the latter environmental condition will take precedence. Thus, if both environmental munificence and turbulence are high, we would expect firms to adopt a fast specialist competitive agility position because dealing with environmental instability would be of primary importance. Similarly, when both



**Figure 2.** Factors affecting the desirability of competitive agility dimensions.

environmental munificence and complexity are high, we would expect firms to adopt a slow generalist position because dealing with environmental complexity would be paramount. When any three or more environmental conditions appear simultaneously, the highest competitive agility position, the fast generalist, is generally warranted. Appropriate competitive agility positions

under such combinations of environmental dimensions are summarized in Table 1. Also included for completeness are appropriate competitive agility positions when a single environmental dimension is salient.

As Table 1 shows, the fast generalist competitive agility position is appropriate in a wide variety of combination environmental conditions. This would seem to imply that greater competitive agility is always needed. But, how often do firms face such environments? As noted earlier, Dess and Beard (1984) found that environmental munificence, dynamism and complexity were

**Table 1.** Salient Environmental Dimensions and Indicated Competitive Agility Positions

<i>Salient Environmental Dimensions</i>	<i>Required Competitive Speed and Variety</i>	<i>Indicated Competitive Agility Position</i>
Munificence	Low Speed Low Variety	Slow Specialist
Turbulence	High Speed	Fast Specialist or Fast Generalist
Instability	High Speed High Variety	Fast Generalist
Complexity	High Variety	Slow Generalist or Fast Generalist
Munificence and Turbulence	High Speed Low Variety	Fast Specialist
Munificence and Complexity	Low Speed High Variety	Slow Generalist
Munificence and Instability	High Speed High Variety	Fast Generalist
Turbulence and Complexity	High Speed High Variety	Fast Generalist
Turbulence and Instability	High Speed High Variety	Fast Generalist
Complexity and Instability	High Speed High Variety	Fast Generalist
Any three or more	High Speed High Variety	Fast Generalist

three independent dimensions of environments. In addition, other empirical studies observed low correlations among these environmental dimensions (Baucus & Near, 1991; Keats & Hitt, 1988; Wholey & Brittain, 1989). Thus, it appears that firms do not often simultaneously need to respond to the demands of multiple environmental dimensions.

Although this suggests that the apparent need for a fast generalist competitive agility position is somewhat overstated by the analysis in Table 1, it should be noted that both low environmental munificence or high environmental instability separately indicate the need for a fast generalist competitive agility position. Similarly, other competitive agility positions are indicated when other environmental conditions prevail singly. Since the relative frequency with which each environmental condition occurs is an empirical question, it follows that the relative frequency with which each of the competitive agility positions might be needed and observed also remains an empirical question.

## DISCUSSION AND CONCLUSIONS

Our analysis suggests the appropriateness of each of four competitive agility positions in response to environmental influences, considered singly or simultaneously. The further influence of early- and late-mover considerations was also discussed. Our approach is consistent with the well-known idea that firms change and adapt to environmental conditions (Miller & Friesen, 1984) and those that achieve a fit with their environments are thought to have improved performance (Galbraith & Kazanjian, 1986). It has also been shown, however, that any advantages of fit obtained by a firm remain only as long as its competitors have not attained this state of fit with their environments (Armour & Teece, 1978), highlighting the importance of speed in responding to environmental changes (Bourgeois & Eisenhardt, 1988). We have extended this literature with our notion of competitive agility by incorporating the idea of the criticality of speed with the concept of competitive variety, developed here as one aspect of competitive agility. Competitive variety, in particular, has not received much consideration in the adaptation literature. One goal of this work is to establish its importance.

A key issue raised by our analysis is the importance of achieving a fast generalist competitive agility position, particularly when a firm needs to respond simultaneously to multiple environmental conditions. It is important to note that achieving such a position is quite difficult to do. Both higher competitive speed and variety place different and greater organizational demands on firms. Greater competitive speed requires that firms reduce cycle times not only in manufacturing but in all aspects of their operations including decision-making processes (Stalk, 1988; Stalk et al., 1992). Greater competitive

variety requires firms to not only develop multiple capabilities but also to coordinate their use when required.

Achieving simultaneous high decision-making speed and high decision-making variety is difficult. This difficulty is illustrated by Eisenhardt's (1989) finding that firms achieved rapid decision-making speed *only* when executive teams were engaged in making a narrowly focused strategic decision. Decision-making speed was achieved by intensive information processing, multiple simultaneous alternative generation and evaluation, conflict resolution, and decision integration. However, engaging in multiple simultaneous decision processes of this nature, required in a situation of high competitive variety, is likely to place inordinate demands on decision makers.

A further complication arises if a firm needs to respond to two environmental dimensions that place contradictory demands on a firm's competitive agility position. For example, if a firm is faced with both environmental complexity and instability, managers would ideally want to develop a fast generalist response (see Table 1). The presence of environmental complexity, however, makes the achievement of high speed, which is demanded by environmental instability, quite difficult because of the organizational demands it places on a firm.

An example of the incompatibility between high competitive speed and environmental complexity pertains to the decision-making process. Effective firms internally duplicate the variety in their external environments (Ashby, 1956), termed requisite variety, through decentralization (Chandler, 1962), and higher structural differentiation (Pfeffer & Salancik, 1978; Thompson, 1967). Such differentiation assists firms in handling the increased information processing requirement resulting from complexity (Pfeffer & Salancik, 1978; Thompson, 1967). Differentiation results in managers becoming increasingly specialized in their respective areas of expertise as they focus more specifically on their relevant environmental sectors (Daft, Sormunen, & Parks, 1988). As such specialization leads to a variety of perspectives on strategic issues, some conflict (Dougherty, 1987) and difficulty in communication (McCain, O'Reilly, & Pfeffer, 1983) will result, slowing the decision process. Fredrickson and Mitchell (1984) further point out that a more highly comprehensive decision process, appropriate in a complex decision-making environment, tends to be slower. Social psychologists have also found an inverse relationship between the difficulty of a decision task and the rate of progress of the decision-making group (Bray et al., 1978; Steiner, 1972). Thus, attempting to speed up complex decision making would be expected to decrease decision quality.

It should be further noted that having a capability for high competitive agility may result in the underutilization of resources, a situation that managers will likely need to defend. Maintaining such a capability is akin to the rapid deployment force that the military maintains. It is costly. But, it is also invaluable when the need arises, for it means the difference between success

and failure. An example of how firms may consider such underutilized resources as "wasteful" is provided by the Exxon Valdez disaster. Until one month before the Exxon Valdez ran aground off of the coast of Alaska and spilled over 16 million barrels of oil creating an environmental disaster of huge proportions, Exxon maintained a team of highly trained professionals to help it deal with just such eventualities. Since they had never been called to duty, the team was disbanded. Some of the serious consequences and costs to Exxon might, perhaps, have been prevented if this rapid deployment team had been available.

In summary, in comparison to an emphasis on any one dimension of competitive agility, speed or variety, an emphasis on both dimensions by seeking to become a fast generalist creates very high organizational demands on firms. It is not surprising, therefore, that the fast generalist position is considered to be one that offers a significant sustainable competitive advantage. It is also not surprising that only a few firms can achieve this position.

#### Achieving Competitive Agility

Given the importance of achieving competitive agility under certain conditions, the issue of how to create this capability would seem paramount. Our discussion of the costs associated with achieving competitive speed and variety suggests some organizational facets that need attention. For example, some firm attributes, such as organization structure, systems, and processes, may affect the degree to which a firm can achieve competitive speed and variety. It is important, therefore, to identify and assess the role of firm attributes in achieving competitive agility.

It is also helpful to conceptualize competitive agility as involving the development of a distinctive competence. Given the same stimuli, firms are expected to act in many different ways depending upon, for example, their particular strengths and weaknesses. Considering competitive agility as a distinctive competence suggests that it derives from the underlying functional and corporate abilities of firms, known to vary among firms. For instance, Sony is well-known for its prowess in product development and miniaturization technology. Matsushita, in contrast, is renowned for its manufacturing and marketing capability (Lieberman & Montgomery, 1988). Firms are expected to differ in the actions taken to achieve competitive agility, therefore, based on differences in their underlying distinctive competences. For example, price cuts might be responded to by new product introductions and vice versa. Firms would also likely respond to regulatory changes in different ways.

A further implication of the role of distinctive competence in achieving competitive agility is that firms can vary in their capabilities for competitive speed and variety in different functions. The competitive value of being agile in particular functional areas is likely to vary with the competitive conditions

in particular industries. For example, rapid new technology development is crucial in the semiconductor industry, while such an ability is of less importance in the paper machinery manufacturing industry.

When evaluating the ways in which competitive speed is achieved, it is important to differentiate between rapid decision-making speed and implementation speed. As noted earlier, some recent studies have found that decision-making speed is positively associated with firm performance (Bourgeois & Eisenhardt, 1988; Eisenhardt, 1989; Judge & Miller, 1991; Smith et al., 1991). Yet we believe that making fast decisions is only part of the story. Rapid response to changed circumstances requires not only making a decision, but implementation actions as well. It is the total time taken to act that determines whether a firm is faster than its competitors and which, in turn, will have an influence on outcomes such as market share and profitability. Hence, organizational arrangements that affect not only decision-making speed but also implementation speed should be studied. This is an area that needs more attention as particularly little work has been done linking individual strategic decisions with the organizational mechanisms to implement them (Skivington & Daft, 1991).

## NOTES

1. Resources are inimitable when they are characterized by *time-compression diseconomies*, *asset mass efficiencies*, *interconnectedness of asset stocks*, *asset erosion* and *causal ambiguity* (Dierckx & Cool, 1989). Time compression diseconomies refers to disproportionately larger investment required to create resource stocks in a shorter time duration. Asset mass efficiencies arise if an initial resource stock facilitates accumulation of additional resource stocks. Interconnectedness implies that additions to existing resource stocks are linked to the level of other resource stocks. Asset erosion occurs when resource stocks decay if not maintained. Causal ambiguity arises when it is impossible to specify how resource stocks are accumulated.

2. As indicated, Bourgeois and Eisenhardt (1988) combine environmental turbulence and instability into their conceptual definition of high velocity environments. They operationalize high velocity environments by concentrating on a single industry, the microcomputer industry, in which high technological and competitive changes were occurring. Although these authors demonstrate that a high correlation between turbulence and instability would seem to appear in some industries at certain stages, work by Wholey and Brittain (1989) reported a nonsignificant relationship between turbulence (labeled frequency) and instability. Thus, our separate treatment appears warranted.

## REFERENCES

- Aldrich, H.E. (1979). *Organizations and environments*. Englewood Cliffs, NJ: Prentice-Hall.  
 Amit, R., & Schoemaker, P.J.H. (1993). Strategic assets and organizational rent. *Strategic Management Journal*, 14, 33-46.  
 Armour, H.O., & Teece, D.J. (1978). Organizational structure and economic performance: A test of the multidivisional hypothesis. *Bell Journal of Economics*, 9, 106-122.

- Ashby, W.R. (1956). *An Introduction to cybernetics*. London: Chapman and Hall.  
 Barney, J.B. (1986). Strategic factor markets: Expectations, luck and business strategy. *Management Science*, 33, 1231-1241.  
 Barney, J.B. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17, 99-120.  
 Baucus, M., & Near, J. (1991). Can illegal corporate behavior be predicted? An event history analysis. *Academy of Management Journal*, 34, 9-36.  
 Bleakley, F.R. (1991, April 3). Citicorp's folly? How a terrific idea for grocery marketing missed its targets. *Wall Street Journal*, pp. A1.  
 Bourgeois, L.J. (1981). On the measurement of organizational slack. *Academy of Management Review*, 6, 29-39.  
 Bourgeois, L.J., & Eisenhardt, K. (1988). Strategic decision processes in high-velocity environments: Four cases in the microcomputer industry. *Management Science*, 34, 816-835.  
 Bower, J.L., & Hout, T.M. (1988). Fast-cycle capability for competitive power. *Harvard Business Review*, 66(6), 110-118.  
 Bray, R.M., Kerr, N.L., & Atkin, R.S. (1978). Effects of group size, problem difficulty, and sex on group performance and member reactions. *Journal of Personality and Social Psychology*, 36, 1224-1240.  
 Burns, T., & Stalker, G.M. (1961). *The management of innovation*. London: Tavistock.  
 Chandler, A. (1962). *Strategy and structure*. Cambridge, MA: MIT Press.  
 Chen, M.J., Smith, K.G., & Grimm, C.M. (1992). Action characteristics as predictors of competitive responses. *Management Science*, 38, 439-455.  
 Child, J. (1972). Organization structure, environment, and performance—the role of strategic choice. *Sociology*, 6, 1-22.  
 Cyert, R.M., & March, J.G. (1963). *A behavioral theory of the firm*. Englewood Cliffs, NJ: Prentice-Hall.  
 Daft, R., Sormunen, J., & Parks, D. (1988). Chief executive scanning, environmental characteristics, and company performance: An empirical study. *Strategic Management Journal*, 9, 123-139.  
 Dess, G.G., & Beard, D.W. (1984). Dimensions of organizational task environments. *Administrative Science Quarterly*, 29, 52-73.  
 Dess, G.G., & Davis, P.S. (1984). Porter's (1980) generic strategies as determinants of strategic group membership and organizational performance. *Academy of Management Journal*, 27, 467-488.  
 Dierckx, I., & Cool, K. (1989). Asset stock accumulation and sustainability of competitive advantage. *Management Science*, 35, 1504-1511.  
 Dougherty, D. (1987). *New products in old organizations: The myth of the better mousetrap in search of the beaten track*. Unpublished doctoral dissertation, Sloan School of Management, MIT.  
 Duncan, R. (1972). Characteristics of organizational environments and perceived environmental uncertainty. *Administrative Science Quarterly*, 17, 313-327.  
 Eisenhardt, K. (1989). Making fast strategic decisions in high-velocity environments. *Academy of Management Journal*, 32, 543-576.  
 Fredrickson, J., & Mitchell, T. (1984). Strategic decision processes: Comprehensiveness and performance in an industry with an unstable environment. *Academy of Management Journal*, 27, 399-423.  
 Galbraith, J.R., & Kazanjian, R.K. (1986). *Strategy implementation: Structure, systems and process*. St. Paul, MN: West Publishing Company.  
 Ghemawat, P. (1986). Sustainable competitive advantage. *Harvard Business Review*, 61(5), 53-58.

- Segev, E. (1989). A systematic comparative analysis and synthesis of two business-level strategic typologies. *Strategic Management Journal*, 10, 487-505.
- Skivington, J., & Daft, R. (1991). A study of organizational 'framework' and 'process' modalities for the implementation of business-level strategic decisions. *Journal of Management Studies*, 28, 45-68.
- Smith, K.G., & Grimm, C.M. (1991). A communication-information model of competitive response timing. *Journal of Management*, 17(1), 5-23.
- Smith, K.G., Grimm, C.M., Chen, M., & Gannon, M.J. (1989). Predictors of response time to competitive strategic actions: Preliminary theory and evidence. *Journal of Business Research*, 18, 245-258.
- Smith, K.G., Grimm, C.M., Gannon, M.J., & Chen, M. (1991). Organizational information processing, competitive responses, and performance in the U.S. domestic airline industry. *Academy of Management Journal*, 34, 60-85.
- Stalk, G. (1988). Time—The next source of competitive advantage. *Harvard Business Review*, 66(4), 41-51.
- Stalk, G., Evans, P., & Shulman, L.E. (1992). Competing on capabilities: The new rules of corporate strategy. *Harvard Business Review*, 70(2), 57-69.
- Starbuck, W.H. (1976). Organizations and their environments. In M.D. Dunnette (Ed.), *Handbook of industrial and organizational psychology* (pp. 1069-1123). Chicago: Rand-McNally.
- Staw, B., Sandelands, L., & Dutton, J. (1981). Threat-rigidity effects in organizational behavior: A multilevel analysis. *Administrative Science Quarterly*, 26, 501-524.
- Steiner, I.D. (1972). *Group process and productivity*. New York: Academic Press.
- Teece, D.J. (1986). Profiting from technological innovation: Implications for integration, collaboration, licensing, and public policy. *Research Policy*, 15, 285-305.
- Thompson, J. (1967). *Organizations in action*. New York: McGraw-Hill.
- Tushman, M., & Romanelli, E. (1985). Organizational evolution: A metamorphosis model of convergence and reorientation. In B. M. Staw & L. L. Cummings (Eds.), *Research in organizational behavior* (Vol. 7, pp. 171-222). Greenwich, CT: JAI Press.
- Vroom, V., & Yetton, P. (1973). *Leadership and decision making*. Pittsburgh, PA: University of Pittsburgh Press.
- Weiss, L. (1974). The concentration—profits relationship and antitrust. In H. Goldschmid, H. Mann, & J. Weston (Eds.), *Industrial concentration: The new learning* (pp. 184-245). Boston: Little-Brown.
- Wernerfelt, B., & Karnani, A. (1987). Competitive strategy under uncertainty. *Strategic Management Journal*, 8, 187-194.
- Wholey, D., & Brittain, J. (1989). Characterizing environmental variation. *Academy of Management Journal*, 32, 867-882.
- Yasai-Ardekani, M. (1989). Effects of environmental scarcity and munificence on the relationship of context to organization structure. *Academy of Management Journal*, 32, 131-156.
- Yoder, S.K. (1992, May 11). Hewlett-Packard is too busy to notice industry slump. *Wall Street Journal*, pp. B4.
- Zajac, E.J., & Shortell, S.M. (1989). Changing generic strategies: Likelihood, direction, and performance implications. *Strategic Management Journal*, 10, 413-430.