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Research on Competitive Dynamics: Recent Accomplishments and Future Challenges

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Understanding the nature and consequences of the competitive dynamics among firms is a key objective of the strategic management field. We review recent developments in six research streams relevant to competitive dynamics: competitive action and response, first-mover advantage, co-opetition, multipoint competition, strategic groups, and regional clusters. As a first step toward filling gaps in knowledge identified in our review, we provide suggestions for future inquiry within each research stream. We also describe opportunities for conceptual integration across the streams that could significantly advance the understanding of competitive dynamics.

Revealing how competitive moves can help firms develop long-term advantages and improve performance is a central goal of strategic management research (Hitt, Boyd & Li, 2004). Such moves include, for example, offering new products ahead of competitors or working cooperatively with a rival in a foreign market. Regardless of the specific competitive move taken, however, it is important to recognize that these moves do not take place in isolation. Each move must be coordinated with other moves so that it strengthens the firm's strategies, and any particular move must be evaluated as to the response it may elicit from rivals.

For example, a flurry of competitive moves occurred in the shaving products industry in August 2003. Market leader Gillette launched a new three-blade disposable razor. Its main rival, Schick, a subsidiary of battery giant Energizer Holdings, followed by introducing

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a four-blade razor backed by a large advertising campaign. Gillette then sued Schick for patent infringement. Meanwhile, Rayovac Corporation acquired Remington Products, a third major shaving products firm, possibly allowing Rayovac to better compete with both Gillette (owner of the Duracell battery line) and Energizer in two different industries.

The *competitive dynamics* literature examines such jockeying for position and its implications for organizational outcomes. A series of moves and countermoves among competitors can create a destructive pattern that sabotages rivals' profits and even threatens the survival of some firms. In the early 1980s, for example, Braniff Airlines' ill-advised launch of a price war with a much bigger rival, American Airlines, contributed directly to Braniff's bankruptcy. Competitive interactions can also protect and enhance firm success. In the oil and pharmaceutical industries, for example, firms rarely take actions that undermine each other's strategies. As a result, these settings have been among the most profitable of industries for some time. Viewed broadly, the competitive dynamics literature attempts to uncover why some interactions turn nasty while others are constructive. As these insights emerge, they help scholars understand organizations, and they provide wisdom to managers charged with maximizing firm performance.

In an effort to collect these insights, this paper's first goal is to chronicle recent major research findings regarding the competitive dynamics among firms within and across industries. We discuss six prominent research streams. Much of the early competitive dynamics research focused on specific action and response characteristics, sometimes referred to as competitive moves and countermoves (see Smith, Ferrier & Ndofor, 2001 for an overview). Thus, *competitive action and response* is the first and most traditional area we address. Next, we examine two specific subsets of action-and-response behavior. *First-mover advantage* research considers the order and timing of actions and responses. *Co-opetition* is a process in which two or more firms simultaneously compete in some areas and cooperate in others (Gee, 2000).

The context in which firms compete affects how they act and respond to each other. *Multipoint competition* refers to instances wherein firms (such as Gillette, Energizer, and Rayovac) are rivals in more than one product category or market. *Strategic groups* are subsets of industry competitors. Firms within a strategic group are similar to each other but different from others in the industry (Hunt, 1972; Porter, 1979). In the final research stream, we focus on a less extensively researched but intriguing contextual element—regional clusters. *Regional clusters* are sets of firms that locate in close proximity to one another (Porter, 1998a). How clustering affects competition is just beginning to be understood and a status report on this research stream is warranted. In reviewing these research streams, we focus mainly on contributions appearing in premier management journals.

The paper's second goal is to outline a future research agenda on competitive dynamics. Despite recent advances, much remains unclear about how and why firms pursue certain strategic moves (Robinson & Chiang, 2002). One possible explanation is that there is little cross-fertilization across research streams. Indeed, it appears to us that each stream has evolved into a 'silo' of knowledge that offers insights about only one or a few aspects of competitive dynamics. To promote the sharing of ideas and constructs across silos, we not only describe research needs within each stream but also build conceptual bridges across the streams by discussing areas of overlap and disagreement.

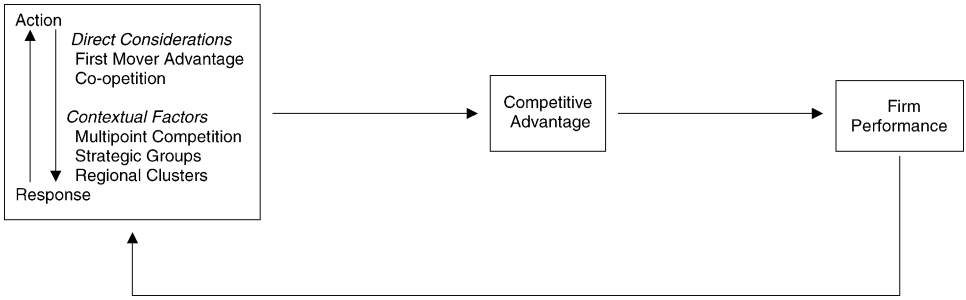

Figure 1. A conceptual map of research streams in competitive dynamics.

Our overall desire, as reflected in Figure 1, is to foster a richer portrait of competitive dynamics than is possible through considering each stream in isolation. This overarching conceptual model offers four main insights. The first box signifies that six main issues we review in this paper are interrelated, not independent. Next, the link between the first and second boxes suggests that firms whose managers effectively orchestrate the six issues in a coherent, integrated way will gain competitive advantages over rivals that do not. Third, the next link depicts the strategy literature's long-held tenet that competitive advantage enhances firm performance (e.g., Porter, 1980). Finally, the feedback loop linking performance and competitive dynamics indicates that current outcomes shape the nature of future rivalrous behavior. With these contentions as a backdrop, below we describe recent accomplishments that shed light on activities within the figure's first box (i.e., competitive dynamics).

Major Recent Findings in Competitive Dynamics Research

Competitive Action and Response

When choosing strategic actions, managers must not only consider how their actions will affect their customers but also how rivals may react. Earlier research concerning competitive action and response examined action characteristics (e.g., scope and magnitude of strategic moves), response characteristics of rival firms (e.g., timing, imitation), and the specific characteristics of the competing firms (e.g., past performance, resource similarity) (Grimm & Smith, 1997). More recent research is focused on the actions and responses of industry leaders and their challengers as well as game theory models to study competitive interaction. Table 1 summarizes major recent findings and accomplishments within the competitive action—response research stream, and those from the other streams discussed in this paper.

Market leaders vs. challengers. A recent series of articles examines whether complacency by industry leaders and/or aggressiveness by challengers can shift the balance of power toward the challenger (Ferrier, Smith & Grimm, 1999; Smith, Ferrier & Grimm, 2001). The findings suggest that leaders are more likely to lose market share and even their leadership position when they initiate fewer moves than challengers, when the breadth of leaders' actions is not as great as challengers', and when leaders are slower to act than chal-

Table 1
The state of competitive dynamics research

Research stream	Key findings and accomplishments
Competitive action and response	Recent studies have focused on leader-challenger dynamics and specific competitive scenarios.
	Game theory has begun to address more realistic competitive situations.
First-mover advantages	First-mover advantages have been shown to be sustainable over a wide variety of industries.
	Studies are beginning to identify the internal and external contingencies associated with first-mover advantages.
Co-opetition	Co-opetition is increasing in practice.
	Research has begun to identify the correlates of effective co-opetition.
Multipoint competition	Various competitive moves under this condition are now being linked to the concept of mutual forbearance.
	Market entry and exit by firms has been examined using multipoint competition as a contingency variable.
	Preliminary research has been conducted on how firms assess multipoint competition as well as why and when they mutually forbear.
Strategic groups	The strategic groups concept is a useful method of classifying competitors.
	Strategic groups usually have differential performance.
	A strategic group may be a powerful referent for managers in that group when they assess competitive actions and responses.
Regional clusters	Research has recently begun to show how clusters form and evolve.
	A few studies have examined the benefits of clustering.

lengers. Leaders are also in jeopardy to the extent that challengers' actions are unpredictable, and when challengers' competitive attacks are more persistent than attacks from the leader. These relationships appear to be tied to key organizational variables. Ferrier (2001) found, for example, that attack duration is negatively related to top management team heterogeneity and past performance and positively related to organizational slack. Thus, a firm with diverse executives, good past performance, and minimal slack may have trouble sustaining attacks even when the competitive context requires it. Overall, the research on leaders and challengers is evolving toward more complex conceptual models.

Although fast responses are generally thought to be better than slow responses, Hopkins (2003) found slower responses by dominant US firms to Japanese challengers to be more beneficial. His results were consistent with a punctuated equilibrium model, in that firms were successful when managers waited until they believed they knew what responses were appropriate. The more popular responses included increased marketing, geographic expansion, price cuts, and developing new products. Once dominant firms decided to respond, their actions were enacted in relatively short bursts rather than consistently over time. As is often the case with research, these conflicting results indicate that the specific links depicted in the original models do not apply under all circumstances. Thus, scholars need to

delineate theoretical boundaries and examine various competitive interaction scenarios in order to gain a more complete picture of the leader-challenger phenomenon.

Competitive interaction scenarios. A few articles offer in-depth scrutiny of specific competitive interaction scenarios. Charitou and Markides (2003) examine responses to disruptive innovations—changes that are in direct conflict with traditional approaches, such as the advent of online security trading. Responses to such attacks may take several forms. First, managers may believe that the innovation will not replace established offerings entirely and therefore may choose to focus on their traditional modes of business while ignoring the innovation. Alternatively, a firm can counter the challenge by implementing a disruptive innovation of its own. The final two responses involve adopting the innovation: the firm either markets both the traditional and the innovative offering (usually by establishing a separate organizational unit for the new one), or it acquiesces to the new way of doing business.

Yoffie and Cusumano (1999) use a metaphor to describe ways in which a seeming underdog may make competitive headway. The authors use judo terminology to account for the competitive dynamics between Netscape and Microsoft. In essence, they describe how smaller firms (such as Netscape) may benefit by (a) being able to move quickly into unoccupied markets, (b) knowing when to exit when attacked directly by larger firms, and (c) being able to use the strengths of a larger opponent against itself. The ultimate triumph of Microsoft's Internet browser over Netscape's model implies these conclusions may have been premature and are clearly in need of empirical validation.

Logic suggests that when a firm has a reputation as a strong defender, other firms are less likely to attack it. However, Clark and Montgomery (1998) found that there may be some qualifications to this general statement. Their simulation and surveys suggest that reputation was more likely to deter attack when the attacker did not consider the target firm to be one of its major rivals. The authors propose two explanations: (1) firms that consider each other major players are already engaged in competitive interaction and are not likely to just stop attacking, and (2) when firms are major competitors they know more details about each other, making it unnecessary to rely as heavily on a general, less precise construct like reputation.

Game theory. Game theory provides mathematical tools for examining strategic actions and responses of players with varying goals (Brandenberger & Nalebuff, 1996; Saloner, 1991). The key game elements include players (firms), potential strategies for each firm, and each firm's payoff for all action/response combinations (Grimm & Smith, 1997). Players determine their preferred course of action by considering the payoff associated with each strategy along with expectations about other players' likely moves.

Game theory traditionally has been criticized for offering overly simplistic and rational depictions of competitive dynamics. Recent advances begin to address this criticism. For example, Erickson (1997) simulated managers' beliefs about how competitors will use advertising to react to changes in market share. The finding that some firms increased advertising following a loss of market share, while others decreased it highlights the role of managerial discretion. Basuroy and Nguyen (1998) examined the game theoretic applications of a popular market share model and found that new brand entry leads to price cuts

by existing rivals. Vilcassim, Kadiyali and Chintagunta (1999) better quantified optimal reactions to price moves and advertising. Shaffer and Zhang (2002) found that promotions tailored to individual customers hurt firms in general by fostering price-based competition, but such promotions build market share for firms with high-quality products. Several of these models were applied in important arenas such as a personal-care-product segment (Vilcassim et al., 1999) and cereal products (Erickson, 1997). Thus, developing more realistic models of firm behavior in order to better inform both theory and practice is the overall aim of recent game theory research.

First-Mover Advantage

The concept of first-mover advantage refers to the benefits gained from pioneering efforts such as the introduction of a new product, entry into a new market, or the implementation of a new process (Lieberman & Montgomery, 1988). Such advantages can arise via learning curve effects, control of scarce resources, or the creation of buyer switching costs (Boulding & Christen, 2001; Grimm & Smith, 1997; Lieberman & Montgomery, 1988). However, first moves are inherently risky. For example, costs may be lower for firms that move later because they can learn from the pioneers' mistakes and adopt more efficient processes and technologies (Boulding & Christen, 2001). In this section, we discuss the main factors addressed by recent first-mover advantage research: sustainability, internal contingencies, and external contingencies. We also discuss methodological concerns that have been raised about this research stream.

Sustainability. One important question surrounding any potential first move is: Will any resultant advantage endure? Makadok (1998) studied the money market mutual fund industry to address this question. Entry into this industry is relatively easy and innovations are readily copied; thus it offers a strict test of first-move sustainability. The study found pricing and market share advantages, but these advantages gradually eroded. Lee, Smith, Grimm and Schomburg's (2000) study of stock price reactions to new product announcements found that earlier entrants had better market reactions than later ones. However, imitations partially eroded first-movers' gains (i.e., first movers had negative abnormal stock returns when an imitation was announced). In a study of 1226 business units spanning six decades, Boulding and Christen (2001) found that first movers enjoyed profit advantages for about 10 years in consumer goods and about 12 years in industrial goods. At those respective points, however, cost disadvantages *vis a vis* later entrants fully eroded the earlier returns to first movers. Overall, findings indicate that first-mover advantages exist in many settings, but they erode over time as competitors imitate and improve upon initial offerings.

Internal contingencies. Several firm characteristics and actions have been examined as factors that affect first-mover advantages. For example, research and development intensity may affect the timing of a first move. Firms that focus on creating technology are the most likely to be able to innovate (leading to a first move) or to quickly imitate. Also, possession of a direct sales force has two features that can lead to faster entry: The sales force can educate customers, and it may be used more efficiently when new products are added (Schoenecker & Cooper, 1998).

Offering a theoretical argument, Tyagi (2000) suggests that when first movers believe that a second mover's costs will be less than their own, first movers will not take the optimal market position. Instead, managers prefer to carve out a niche where the firm will not compete directly with a second mover. Eisenmann and Bower (2000) drew examples from global media firms to suggest that a 'top-down' management approach is necessary for divisionally structured organizations to act with the speed needed to obtain first-mover advantages.

Type of strategy and tactics are also important internal contingencies. Durand and Coeurderoy (2001) found that both pioneers and late entrants could benefit from a low-cost strategy, while early followers used differentiation strategies based on innovation or marketing. Covin, Slevin and Heeley (2000) found that different tactics led to higher sales growth for first movers faced with different environmental conditions. In hostile environments (i.e., those characterized by high failure rates, intense price competition, and little customer loyalty), pioneers were best off charging higher prices, limiting their product lines, and having wide geographical market coverage. In benign environments, pioneers benefited from offering superior warranties and maintaining a large number of distribution channels.

The size of market entry has also been studied. Mascarenhas (1997) found that larger entry size did not increase firm performance. However, these findings may be context-specific. In the offshore drilling industry examined, governmental regulations strongly influenced supply and demand. Also, some countries may not be developed enough for large entries to make sense. In other settings, such as consumer goods industries, a firm may be able to create demand via large entries.

External contingencies. Some studies have examined whether external conditions can facilitate first-mover advantages. Industry context is a key variable of interest here. In a survey of over 2400 managers, manufacturing firm managers generally perceived pioneering's advantages and risks to be greater than did their service industry counterparts (Song, Di Benedetto & Zhao, 1999). Service firm managers believe that first movers can obtain market share but not profits, whereas manufacturers believe both are possible. The authors contend that first-mover advantages are less likely in service industries because services are more easily imitated than goods. One implication is that first-mover advantages are most relevant in manufacturing industries. Consistent with this view, most recent studies examine such settings.

Within the manufacturing sector, seemingly similar industries may provide different levels of first-mover opportunities. Schoenecker and Cooper (1998) used a combination of anecdotal evidence, expert surveys, and examination of post-entry market share to show how the minicomputer industry segment was more conducive to first-mover advantages than was the personal computer segment. Advantages were likely because minicomputers (a) created higher switching costs for consumers, (b) served limited market niches such that gaining a market position early was important, and (c) were not as easy to copy as personal computers.

Bohlmann, Golder and Mitra (2002) focused on consumer preferences. Using game-theoretic modeling, they showed that when the quality of a product was important to consumers, later entrants were best able to use new, improved technology to gain advantages over the first mover. However, when a variety of product attributes was important to consumers, then the first mover was better able to maintain its lead.

The effects of national context on first-mover advantages also have been examined. Contrary to the argument that emerging economies' high uncertainty levels discourage firms to enter markets early, two studies found that first-mover advantages may exist in such contexts (Isobe et al., 2000; Pan & Chi, 1999). Meanwhile, Song et al. (1999) found that Western managers perceive the cost advantages of early moves to be stronger than do their Asian-Pacific counterparts. Taken together, these studies suggest that while potential first-mover advantages are widespread, managers' propensity to pursue them vary by region and culture.

Regulatory contexts may also affect first-mover advantages. Nehrt (1998) noted that government environmental policy differs among international rivals and therefore affects first-mover advantages. For example, firms implementing pollution-reducing technologies that go beyond simply filtering out pollutants to lower costs or enhance sales may gain the skills and flexibility necessary for improving their position in various regulatory settings. Similarly, a government decision to privatize industries can set the stage for first-mover advantages, particularly when regulations restrict competition and/or liberalization is delayed (Doh, 2000).

Finally, general market conditions may affect first-mover firms. Durand and Coeurderoy (2001) found that first movers were relatively unaffected by environmental unpredictability, and that moving first in an emerging market helps pioneers maintain their advantage more than pioneering in established markets. Also, certain competitive tactics (Covin et al., 2000) and management styles (Eisenmann & Bower, 2000) may be more effective depending upon an industry's degree of hostility.

Methodological concerns. To discover if methodology issues are shaping results in this literature, VanderWerf and Mahon (1997) performed a meta-analysis of 90 tests that examined the entry timing–performance relationship. They found that pioneering advantages were more likely to be found in studies that have certain weaknesses, including using market share as the sole outcome measure, focusing only on industries with known first-mover advantages, and failing to account for entrant strength. VanderWerf and Mahon claim that pioneering advantages will not be found in studies that avoid these problems.

The more recent studies (covered in this review) of the entry timing–performance relationship have addressed methods issues well. None use market share as the only performance indicator. Also, most studies include some measure of key firm attributes, such as resources. An ongoing issue is that most studies do not use random sampling, so the degree of generalizability is unclear. Although skewed samples may not provide a completely accurate picture of the extent of first-mover advantages, it is valuable to understand specific industry effects on first-mover advantages.

Co-opetition

The concept of requisite variety maintains that effective firms match the environment's complexity with the internal complexity of their structures and processes (Ashby, 1956). Some firms have responded to the modern competitive context by enacting complex relations wherein they cooperate *and* compete with the same firms. For example, Swedish brewing firms work together in recycling used bottles, but they compete in product development and distribution (Bengtsson & Kock, 2000). These firms seek efficiency in an area that

is less visible to customers, while each firm simultaneously tries to differentiate itself for competitive purposes. Raymond Noorda, Novell's founder and former CEO, coined the term 'co-opetition' to describe such simultaneous competition and cooperation between firms (Gee, 2000).

The small body of extant research asserts that co-opetive relationships must be constructed and managed in such a way that they enhance elements of firms' competitive strategies without undermining other elements. Khanna, Gulati and Nohria (2000) posit that cooperation erodes if extensive benefits that accrue to only one alliance member are possible. Further, a firm competes more if an alliance is not viewed as integral to the firm's strategy. Das and Teng (2000) explain that when partners have a short-term focus, structural rigidity (such as joint equity ownership or non-recoverable investments) encourages cooperation while structural flexibility (no extra safeguards in place) fosters competition. In contrast, when partners have a long-term orientation, rigid structures may lead them to be wary of unintended knowledge transfer. Thus, they may be less cooperative than if the relationship were more flexible.

Gnyawali and Madhavan (2001) consider how cooperative network characteristics influence firm action and response. They theorized that the more central and structurally autonomous a firm is compared to other network members, the more likely the focal firm is to make a competitive strike, and the less likely it is that a competitor will respond. However, a focal firm will be less likely to attack (and the competitor, more likely to respond) when they are structurally equivalent. Overall, network density decreases any firm's propensity toward action and increases other firms' propensity toward response. Thus, network characteristics can significantly influence the nature of co-opetition among network members.

Some research emphasizes the need for top management to actively shepherd co-opetive efforts. Bengtsson and Kock (2000) assert that the cooperation-competition tension should not be seen as dangerous. Instead, top management teams should understand and communicate to organizational members that cooperation and competition can exist simultaneously, and both can contribute to achieving organizational goals. Lado, Boyd and Hanlon (1997) point out that the top management team's posture in promoting or discouraging co-opetive behaviors clearly affects the firm's ability to participate in co-opetive relationships. Overall, co-opetition potentially can lead to competitive advantages if it is designed in such a way that its negatives are minimized or avoided altogether.

Multipoint Competition

Research examining competition often implicitly assumes that competition is within a single setting. In contrast, research on multipoint competition considers firms that compete in two or more arenas (Karnani & Wernerfelt, 1985). Such competition may occur across products, geographic regions, or market segments. For instance, Energizer and Gillette compete in multiple product categories, including shaving supplies and batteries. Airlines compete with each other in multiple geographic regions. And, the hotel firms Hilton and Marriott both have chains competing in the luxury, mid-range, and extended-stay segments.

Mutual forbearance. Most studies examining multipoint competition consider mutual forbearance—'the ceding of control of one product or geographic market to a competitor in exchange for that competitor's acquiescence in another market' (Golden & Ma, 2003: 479). This reduced rivalry is believed to lead to better performance for all firms involved.

Gimeno and Woo (1999) examined how a firm's ability to share resources across units and firms' multipoint contact jointly influence efficiency, rivalry, and profitability. Firms that have units which share resources (in order to gain economies of scope) are likely to meet other firms in multiple markets because these competitors also attempt to gain scope economies. They also found support for the mutual forbearance hypothesis—that rivalry decreased and profitability increased as multipoint contact increased. These effects were even greater when there were resource-sharing opportunities.

Gimeno (1999) focused on how markets' relative strategic importance to each firm influences firm behavior. He found that when firms have reciprocal relationships (e.g., Firm A has greater strategic interest in market 1 than Firm B, but in market 2 Firm B has greater interest), they are less likely to engage in intense rivalry than when their relationships are nonreciprocal (e.g., Firm A has a larger interest than Firm B in both markets). Subordinate firms fear being attacked in their more important markets, and leaders realize they have multiple venues for attack if need be, thus they do not need to attack in their important market.

Young, Smith, Grimm and Simon (2000) focused on resource dissimilarity between competitors. The authors theorized that to the extent that rivals possess and rely on different resources, their competitive behavior is more aggressive. Accordingly, the study found that resource dissimilarity led firms to take more actions and to enact them quicker. However, these effects are mitigated by multipoint contact. Specifically, multipoint contact tends to reduce firms' rivalrous behavior to the extent that the firms have dissimilar resources. Also, the actions that such rivals enact tend to be taken quickly. This interaction not only identifies relations among variables but also suggests the value of integrating the resource-based view of the firm and insights from the competitive dynamics literature.

McGrath, Chen and MacMillan (1998) recognize that a given firm may attempt to shift a mutual forbearance-based equilibrium by changing its position in one or more markets. They describe various tactics that can cause a competitor to shift resources. For example, a firm may engage another firm in competition in one market, causing the competitor to shift resources to this market, in order to secretly establish a bigger foothold in a different market (away from which the competitor's resources have been diverted). Overall, recent work provides support for the mutual forbearance concept and clarifies how forbearance may differ across situations, particularly concerning the sharing, importance, and similarity (across firms) of resources.

Entry and exit. Recent attention has been given to entry rates into and exit rates from common markets. One consistent finding is that the relationship between multipoint contact and market entry is inverted-U shaped (Baum & Korn, 1999; Haveman & Nonnemaker, 2000; Stephan, Murmann, Boeker & Goodstein, 2003). According to Haveman and Nonnemaker (2000), when multipoint contact is low, a firm will attempt to obtain information about competitors by engaging them in many markets. Also, it will attempt to gain

footholds in multiple markets in order to be seen as a credible threat. Thus, when multipoint contact is low, entry into new markets will be rapid. However, as multipoint contact increases, each firm is vulnerable in multiple arenas, leading managers to recognize the benefits of avoiding fierce competition. As a result, entry rates decline.

Each study of the multimarket contact–market entry relationship has clarified it by including contingency variables, such as market structure, organizational size, and CEO characteristics. Haveman and Nonnemaker (2000) found that multipoint contact effects are greater when markets are controlled by a few dominant multimarket firms. Furthermore, single market firms act in a manner consistent with the idea that there are spillover benefits to them when their competitors are engaged in multipoint contact. For instance, to avoid attacking its multipoint competitors, a multimarket firm may decease its advertising, which could benefit single-market firms in addition to other multimarket firms.

Baum and Korn (1999) found rivals' size and scope matter to market entry—a firm is more likely to enter a small firm's markets, and more likely to enter the markets of firms with which they only share a few markets. Stephan et al. (2003) hypothesized that a longer tenured CEO will better understand the intricacies of a firm's multipoint relationships and will exhibit greater respect for these relationship dynamics than will shorter tenured CEOs. Indeed, they found that the relationship between multipoint contact and market entry to be consistent with prior expectations (an inverted-U relationship) for longer tenured CEOs but found a positive, linear relationship when shorter tenured CEOs were in charge.

The results concerning multipoint contact and market exit lack consistency. In Boeker, Goodstein, Stephan and Murman's (1997) study, a firm was less likely to exit a market where it met firms with which it competed in other markets. According to the authors, there are at least three dynamics that may lessen the likelihood of market exit: (1) rivalry may be lessened (in turn lessening the need to exit) due to mutual forbearance, (2) a firm may want to stay in the mutual market such that it maintains multiple venues from which to attack other firms, and (3) a firm may be able to gain more information about its competitors by remaining in markets with them.

However, Baum and Korn (1999) found that multipoint contact and market exit have an inverted-U shaped relationship. They argued that with low multipoint contact there is limited rivalry and limited incentive (e.g., to signal subordination in a particular market) to cause firms to exit. As multipoint contact increases, there is more pressure for these firms to jockey for position and establish which markets they will hold and which they will sacrifice. Thus, exit rates increase. With greater multipoint contact, market exit declines because of the resulting competitive stability.

Internal firm characteristics. Although most relevant studies focus on factors external to the firm, firms' own traits may influence the likelihood and success of mutual forbearance. Golden and Ma (2003) posit that firms with efficient between-unit integrating mechanisms, as well as reward structures that encourage between-unit cooperation, are the most likely to recognize and exploit opportunities for mutual forbearance. Also, such firms are more likely to have unit managers willing to make sacrifices in their own unit in order to benefit the firm.

Included in the formal integrating mechanisms may be internal systems to analyze multipoint competitors. D'Aveni (2002) provides a method for analyzing competitive pressure

that includes multipoint contact considerations. He explains that pressure should be mapped across markets based on two criteria: the market's importance to each firm and each firm's market share. Various enhancements can be added to this basic map, such as including firms' financial strength, alliances, and forbearing relationships. Such a map builds understanding not only of rivals' current positions, but also where rivals are likely to take action thus creating additional pressure on the firm (see also Macmillan, van Putten & McGrath, 2003).

Strategic Groups

A strategic group is a subset of industry competitors that have similar characteristics (Hunt, 1972; Porter, 1979). For example, the pharmaceutical industry contains three main strategic groups. One group contains large firms such as Eli Lilly and Pfizer that focus on new product development as well as manufacturing and sales ("big pharma"). These firms spend vast sums on research and development to create high-margin patented products that are sold through vast distribution networks. Another group of firms makes generics; low-cost copies of drugs with expired patents (e.g., Marion Labs, ICN, and Teva). A third group is relatively small research and development firms focused solely on one or a few therapeutics, often through alliances with big pharma firms. The long-studied question of whether strategic groups exist and, if they do, how they affect firm performance remains central in the literature (Dranove, Peteraf & Shanley, 1998). A newer theme of strategic groups as referents has also emerged.

Do strategic groups exist?. In the late 1980s and early 1990s, several articles questioned the existence of strategic groups (Barney & Hoskisson, 1990; Hatten & Hatten, 1987; Thomas & Venkatraman, 1988). One concern centered on the lack of theoretical explanation for how groups arise. In response, Mehra and Floyd (1998) suggest that sufficient product/market heterogeneity, inimitable resources, and mobility barriers are necessary for groups to form. To the extent that these elements restrict between-group movement, groups remain stable over time. For example, the prevalence and importance of patents in the pharmaceutical industry helps maintain the industry's group structure.

Drawing on social learning theory, Peteraf and Shanley (1997) argue that strategic groups may coalesce around a shared identity. Strategic group identity is "a set of mutual understandings among members of a cognitive intraindustry group regarding the central, enduring, and distinctive characteristics of the group" (Peteraf & Shanley, 1997: 166). Once established, a strong strategic group identity not only defines a group but also facilitates collective action, efficiency gains, and reputation enhancement. On the downside, strong identity also may introduce inflexibility and narrow thinking.

In-depth industry studies have highlighted other mechanisms that facilitate strategic group formation. Greve's (1998) study of radio formats in 12 US states found that firms copy the formats of a few innovators, especially those in close geographic proximity, that are similar in size, and with which they have market contact. This suggests that mimetic isomorphism helps to create strategic groups (DiMaggio & Powell, 1983). Lee (2003) examined the US pharmaceutical industry's evolution into two strategic groups (big pharma and generics firms). In the 1920s and 1930s, there were no strategic groups. In the 1940s, antibiotics began to be marketed. Firms that invested more heavily in research and development split into an

innovator group, while others pursued imitator strategies. Thus, risk propensity may be an important factor that drives group formation. The more recent development of a strategic group composed of alliances between big and small firms in the medical biotechnology segment of the industry is consistent with this view.

A second major criticism was that strategic groups might simply be statistical artifacts because the clustering techniques typically used to identify groups are predisposed to find groups. Two recent studies use triangulation to address this issue. Nath and Gruca (1997) used data on hospitals to determine whether three different group identification methods resulted in the same number of groups. One method was cluster analysis of archival data, a second method was cluster analysis of survey responses from hospital executives, and the third method was interviews of hospital executives who were asked to identify two hospitals with which they compete. The groups provided by each method overlapped substantially, indicating that a real phenomenon was being captured. In a similar vein, Osborne, Stubbart and Ramaprasad (2001) used content analysis of presidents' letters to shareholders to identify strategic groups among pharmaceutical firms. Using the same sample and time frame as Cool and Schendel (1987), but different data sources and variables, Osborne et al. (2001) found essentially the same strategic groups as did the earlier study. Given these various findings, it seems reasonable to conclude that strategic groups do exist and that the strategic group is a useful construct in competitive dynamics research.

Strategic groups and firm performance. There is considerable evidence suggesting that strategic group membership affects firm performance. For example, in a meta-analysis of 32 studies (including many strategic groups studies), Ketchen et al. (1997) found that eight percent of the performance variance among firms can be attributed to 'configuration' membership. Nair and Kotha (2001) provide further evidence from the Japanese steel industry. Even after accounting for environmental and firm-level effects, group membership was related to firm-level performance. Nath and Gruca (1997) found performance differences across groups of hospitals in a metropolitan statistical area. Ferguson, Deephouse and Ferguson (2000) found that reputation differed across strategic groups and that better strategic group reputation was related to higher performance. In a study that provided this research stream with methodological diversity, Lee, Lee and Rho's (2002) simulation found that performance differences persist when there are high mobility barriers and strategic interaction among high-performing firms that inhibited further entry into the group.

Other studies offer contradictory findings. Segev, Raveh and Farjoun (1999) identified strategic groups of top 25 MBA programs based on core courses and concentration areas available. The highest performers did not belong to the same group; each of the top five schools came from different groups. McNamara, Deephouse and Luce (2003) found that performance differences were larger within strategic groups of banks than across groups. Finally, Houthoofd and Heene's (1997) study of the Belgian brewing industry offers the 'strategic scope group' as an alternative level of analysis. A strategic scope group is a broad categorization of firms that may contain several strategic groups. This study found performance differences across strategic scope groups but not across strategic groups. Overall, the evidence remains mixed, but the majority of it supports between-group performance differences across firms and industries.

Strategic group referents. As noted earlier, a firm's competitive position and performance cannot be understood in isolation. Only in comparison to relevant benchmarks can evaluative judgments be meaningful. Even the term *position* implies the necessity of a referent because a position is determined relative to something else. Recognition that industry and market averages may be too broad to provide managers with useful reference points has led scholars to consider the role of strategic groups as referents (Fiegenbaum & Thomas, 1995).

The body of evidence on this issue is small but fairly compelling. Garcia-Pont and Nohria (2002) found that automobile manufacturers were likely to mimic the alliance dynamics of group members not the industry as a whole. A study of Dutch accounting firms found that strategic group membership influenced imitation of firms' internal structures (Lee & Pennings, 2002). Nair and Filer (2003) found that firms' strategic adjustments move toward equilibrium within a group over time, supporting the notion that firms within a strategic group relate to each other in terms of their behavior. Smith, Grimm, Wally and Young's (1997) study of airline companies revealed that group membership was predictive of the frequency of moves, which firms take action, the degree of imitation, and the inclination for price-cutting moves. Taken together, these studies suggest that managers assess potential actions and outcomes relative to strategic group members (see also Ketchen & Palmer, 1999; Pegels, Song & Yang, 2000).

Regional Clusters

Regional clusters are "critical masses—in one place—of unusual competitive success in particular fields" (Porter, 1998a: 78). Clusters may contain both direct competitors and linked entities, such as suppliers, universities, and complementary firms. Two famous examples of regional clusters are the high technology cluster in Silicon Valley and the entertainment cluster in Hollywood, California. The limited management research on this topic centers on two main questions: 'how do clusters form and evolve?' and 'what are the benefits of clustering?'

Cluster formation and evolution. As Baum and Haveman (1997) note, managers must weigh the benefits of locating far from similar firms and the benefits of being near similar firms. Perhaps the most obvious way for a cluster to form is that several firms are attracted to input conditions such as location near a raw material, key intangible assets such as human resources, or the existence of related industries. For example, in one study, firms producing energy from wind necessarily located near one another because the location offered the strongest winds (Russo, 2003). The study also supported the idea that firms tend to concentrate geographically in order to share information, acquire knowledgeable employees, and access competent suppliers. Thus, a broad set of potential drivers should be considered. Indeed, other sources of cluster formation are local demand for a specific product or service, one or two leading companies fueling growth, and even random chance (Porter, 1998a).

A final way clusters may develop is through government initiatives. In a case study, Mathews (1997) described Hsinchu Park (the 'Silicon Valley' of Taiwan) as an example of such a cluster. The two clusters are similar in many ways, such as containing university resources, valuable labor pools, access to capital, and related industries. However, whereas Silicon Valley tries to create new technologies, Hsinchu Park is primarily focused on the

diffusion of existing technologies. Mathews (1997) concluded that technology diffusion may be a more appropriate goal when a cluster is largely initiated by a government.

Two studies shed light on cluster evolution. National differences seem to be a key antecedent. Owen-Smith, Riccaboni, Pammolli and Powell (2002) found that regional clusters in the life sciences area in the United States were general in nature and had numerous ties with other clusters, whereas European clusters each have their own scientific specialty and are relatively isolated. Owen-Smith et al. (2002) conclude that these characteristics may have adversely affected the growth of the European life science industries. Even within the same nation and industry, cluster evolution seems to vary. Almeida and Kogut (1999) found that semiconductor clusters in the US differed in their propensity for interfirm knowledge flows. This was due in part to the mobility of the knowledge-carrying workforce (e.g., when engineers move from one company to another within the same cluster, knowledge is transferred to that new within-cluster company).

Clustering benefits. Regional clusters offer two main types of benefits. The main driver of production benefits is information flows between firms, which are made easier when firms are in close proximity (Chung & Kalnins, 2001). Several studies support the idea that such information flows exist and help regional cluster members be successful. In a study of semiconductor clusters, Almeida and Kogut (1999) found that the flow of knowledge is localized within a regional cluster and not as easily diffused throughout the industry. Furthermore, DeCarolis and Deeds (1999) found that knowledge transfer enhances performance for clustered firms. However, if firm concentration is too high, intense competition for resources may cause outcomes to be less favorable (Deeds, DeCarolis & Coombs, 2000). Thus, balancing the costs and benefits of cluster participation is a key managerial challenge.

The second benefit is heightened demand. Two studies of hotels found results consistent with this idea. However, both studies acknowledge the disadvantages of clustering. Baum and Haveman (1997) surmised that the costs of increased rivalry may outweigh potential agglomeration benefits, particularly when firms are similar in size. Chung and Kalnins (2001) found that not all firms benefited and contributed equally. Larger and chain hotels contributed more than smaller, non-chain hotels, but the smaller hotels were better able to reap the benefits of concentrated demand than were the larger and chain hotels (see also Shaver & Flyer, 2000).

Overall, extant research appears to have established the regional cluster construct as useful. However, the inquiry to date has centered on intuitively apparent causes, benefits, and costs of clustering. Future progress toward establishing the regional cluster's value as a construct may hinge on researchers' willingness to adopt broader and more creative perspectives. Tallman, Jenkins, Henry and Pinch (2004) take a significant step in this direction by suggesting that the cluster is a legitimate level of analysis with unique characteristics, not just an interconnected set of firms.

Future Research Needs

In this section, we first outline the pressing issues that warrant attention within each research stream. These research opportunities are summarized in Table 2. Then we discuss high-potential research opportunities that cut across streams.

Table 2
Research opportunities within each research stream

Research stream	Opportunities
Competitive action and response	Conduct studies of competitive interactions that compare two or more situations.
	Longitudinal studies.
	Discover if and how firms other than second players contribute to market leaders' demises.
First-mover advantages	Extend first-mover concept beyond new products and markets to other areas.
	Examine first-mover advantages from a resource-based perspective.
Co-opetition	Definitional studies that clarify the co-opetition concept.
	Identify and validate measures of co-opetitive success.
	Optimal blends of cooperation and competition to achieve high firm performance along the value chain.
Multipoint competition	Diagnose managerial interpretations of how and why multipoint competition emerges and evolves.
	Studies that examine multiple firms in competitive contact and links to firm performance.
	Models that include three or more firms in both direct and indirect competition.
Strategic groups	Use state-of-the-art methods to conduct studies of the strategic group–firm performance relationship.
	Determine role and importance of the strategic group as a competitive referent.
Regional clusters	Contingency studies that show how different types of firms benefit from clustering.
	Studies of declining clusters to highlight important evolutionary variables

Research Opportunities Within Each Stream

Competitive action and response. The recent trend to examine specific scenarios of competitive interaction should be continued. However, the ultimate objective of such research should be establishing generalizability, so the most useful studies will be those that compare two or more scenarios. Also, this stream would benefit from longitudinal research. For example, within the realm of leaders and challengers, it may be useful to examine the longer term effects of upsetting the leader. For instance, does the leader continue to fall or does it become the 'challenger'? It would also be useful to learn how firms beyond second players are affected by leader/challenger rivalry as well as if they contribute to the leader's downfall. Extending this approach, it would be useful to see if a change in leadership affects the general level of firm rivalry within an industry.

First-mover advantage. A logical new frontier for first-mover advantage research is to extend beyond the traditional focus on new product offerings and new market entry. For example, Michael (2003) found that restaurant firms that were early to franchise had better outcomes than other franchisors while Carow, Heron and Saxton (2004) found that

well formulated acquisitions at the onset of acquisition waves provide valuable results (as measured by abnormal stock returns). These studies take a phenomenon (franchising, acquisitions) and use the concept of first-mover advantage to explain a specific aspect of the phenomenon. Exploration along these lines could be useful in other phenomenon-based research streams (e.g., divestitures).

The linkage between first-mover advantages and the resource-based view (RBV) is also of interest (Lieberman & Montgomery, 1998a, 1998b). For example, it may be helpful to examine durability effects of first moves in terms of imitation from an RBV standpoint. Thus, erosion of a first-mover advantage is not necessarily due to the product being imitated, but advantages are eroded (or sustained) because the resources created from pioneering are (or are not) being imitated. Makadok (2001) provides similar reasoning for why the low entry/imitation barrier industry he studied still has first-mover advantages. Another linkage that could be examined is how the resources created from first-moving fit within the network of a firm's resources (Black & Boal, 1994). This line of reasoning should extend beyond simply determining how a firm's current resources can help achieve first-mover advantages to looking at how resources created through first moves can supplement or complement existing resources.

Co-opetition. As a relatively new construct, much remains unknown about co-opetition. And yet the phenomenon in practice is on the rise. A logical first step would be to more clearly define the construct. It may be helpful to clarify the term cooperation (e.g., how formal/informal or tacit/explicit can the cooperation be? Does it include tacit price collusion?). A closely related second step is to determine appropriate measures of successful co-opetition. Strategy research tends to emphasize single-firm financial and market measures, but a broader view of outcomes is needed in this context. Intermediate outcomes may include variables such as trust levels achieved or the relationship's duration. Final outcomes may include perceived (by top managers or subunits) success, concurrent (by all firms in a relationship) financial gain, co-opetive relationship goal achievement, product or process improvement, and/or resource sharing. In attempting to delineate co-opetition's effects on firm performance, field research methods such as case studies and surveys are likely to be the most useful (Snow & Thomas, 1994).

Once well-grounded conceptualizations are developed, researchers should examine whether co-opetition does indeed lead to superior performance. If significant effects are found, the next logical step would be to determine the appropriate balance between cooperation and competition under various contingencies, such as the stages of the industry life cycle and how directly firms compete. Additionally, researchers could determine the optimal locations in the value chain at which firms should compete and cooperate. In an initial effort, Bengtsson and Kock's (2000) case study research found that competition tended to occur closer in the value chain to the customer than did cooperation. Future work could examine the generalizability of this insight via large-scale empirical studies.

Multipoint competition. Most extant studies assume that efforts to establish multipoint contact are products of calculated efforts by managers. In contrast, Korn and Baum's (1999) results indicate that chance is the most likely explanation for moves that increased multipoint contact. They also found that some firms simply imitate high-performing firms by entering

the same markets as high performers without necessarily taking into account that multipoint contact is being established. Identifying the antecedents to multipoint contact may aid researchers in learning how managers view multipoint contact (as something that just happens vs. something they intentionally seek out), thus influencing their subsequent actions.

Two other potential lines of research within multipoint competition pertain to more sophisticated models. Although anecdotal evidence suggests a complex series of actions may take place between multipoint competitors (Macmillan et al., 2003; McGrath et al., 1998), detailed studies that link these actions to firm performance would be valuable. Models of multipoint contact should also move beyond pairs of firms. Most conceptualizations fail to account for more than two players at a time, yet real rivalry often involves several firms in both direct and indirect competition.

Strategic groups. Ambiguity still surrounds the strategic groups–firm performance relationship. Future studies of this relationship need to carefully consider certain methodological issues. Reviewing 24 tests of the relationship, Ferguson and Ketchen (1999) found that most lacked sufficient statistical power. Viewed alongside evidence that strategic groups researchers often misuse cluster analysis (Ketchen & Shook, 1996), one implication is that consistently rigorous studies are needed to capture the strategic groups construct in its entirety. In addition, research on the major contingencies that shape the nature and strength of between-group performance differences is needed. Also, given that Ketchen et al.'s (1997) meta-analysis included only studies through 1994, perhaps the time is right for another meta-analysis.

There is also a need for studies that directly assess strategic groups' role as referents. McNamara, Luce and Thompson's (2002) study of 76 bank top management teams takes a step in this direction. The study builds on the contention of managerial cognition research that, as imperfect information processors, managers must categorize elements of their competitive context as part of sensemaking efforts (e.g., Dutton & Jackson, 1987). Such categorization provides needed order and simplification to support effective decision-making. In McNamara et al. (2002), teams that were intimately familiar with many competitors' strategies, but classified firms into broad strategic groups, enjoyed higher return on assets than did teams with other interpretations of the competitive arena. These results suggest that a well-conceived blend of specific and broad referents facilitates enhanced organizational outcomes. It remains to future research, however, to clearly delineate the links among firm referents, action, and performance.

Regional clusters. One promising area for further inquiry is that of the types of firms that join clusters and those that benefit most from clustering. Findings thus far have been largely based on size (e.g., Shaver & Flyer, 2000). Other qualities such as strategy or top management team characteristics should be considered. For example, perhaps those firms pursuing a differentiation strategy can benefit from clustering by having access to basic inputs and information but simply adjusting the final product to meet specific customers' needs.

While researchers have recognized the importance of understanding the emergence and growth of regional clusters, little attention has focused on understanding clusters' decline. Two conceptual pieces offer some insights. Porter (1998a) suggests clusters may degenerate because of technological discontinuities, inconsistencies between local demand and

demand in other areas, and rigidities, such as those caused by government intervention or over-commitment to the status quo. Pouder and St. John (1996) propose a three-phase (origination, convergence, and reorientation) model of cluster success and failure, but little work has been done to substantiate this or any other such model.

Opportunities for Building Bridges Across Research Streams

We believe that the competitive dynamics area can offer conclusions of greater value to scholars and managers by adopting integrative perspectives that better reflect competitive reality. Therefore, we next describe what we regard as the highest potential opportunities for building conceptual and empirical bridges between streams.

Regional clusters and first-mover advantages. The regional cluster literature has made rudimentary progress in describing how regional clusters arise (e.g., Mathews, 1997) and the benefits of clustering (Chung & Kalnins, 2001; DeCarolis & Deeds, 1999). One possibly fruitful extension of those efforts is learning how first movers contribute to the growth of, and can gain benefits from, regional clusters. Based on first-mover logic, early entrants to a regional cluster should have the best opportunity to build brand loyalty, inexpensively acquire prime locations, and exploit monopoly rents (Lieberman & Montgomery, 1988; Smith, Grimm & Gannon, 1992). However, first movers will also face uncertain demand, a potential lack of infrastructure, and the need to cultivate a local knowledge base. Late movers, on the other hand, may enjoy established demand, infrastructure, and a knowledge base (Chung & Kalnins, 2001; Porter, 1998a). The key challenges facing late movers include possible market saturation, expensive real estate, and a scarcity of good locations. How these respective positives and negatives interact to influence competitive advantage and firm performance are ripe issues for inquiry.

Juxtaposing the two research streams offers opportunities in the form of conceptual contradictions as well. From the perspective of the first-mover literature, later entrants are forced to steal market share from existing firms. From the regional cluster view, demand increases as a regional cluster grows and attracts new customers. We suspect that this contradiction can be resolved through a contingency approach. That is, under some circumstances, demand is in fact a zero-sum game wherein new entrants must lure away existing customers. In other situations, a growing and critical mass of providers attracts an increasing number of customers to the benefit of all firms. Identifying the key contingencies that create each scenario provides an opportunity for detailed empirical research.

First-mover advantages and strategic groups. An array of factors needs to be considered when managers contemplate a potential first move. Identifying which competitors will probably respond to a first move is particularly vital. Insights from the strategic groups literature may help with this task. Studies in this area have found that strategic imitation is most likely to happen within strategic groups (Garcia-Pont & Nohria, 2002; Lee & Pennings, 2002; Smith et al., 1997). A logical next step would be to determine if this general finding could be extended to include first-move imitation (i.e., are second moves likely to come from within the first mover's strategic group?) A second and perhaps more important issue is examining if imitation by a member of one's own group has different implications for

the scope and duration of first-mover advantages than does imitation by a firm outside the group.

Multipoint competition and co-opetition. Both of these research streams consider competition and cooperation, suggesting insights from each could be used to develop ideas highlighted in the other. Typically, when scholars consider multipoint contact, their focus is on either cooperation/mutual forbearance (e.g., Young et al., 2000) or competition (McGrath et al., 1998), yet the co-opetition literature argues that competition and cooperation can exist simultaneously between two firms. As a starting point toward incorporating co-opetition-based insights, we offer three research questions about multipoint contact: (1) Do multipoint firms go through phases of cooperation and competition or do both cooperation and competition exist at the same time? (2) Do multipoint firms tend to forbear and/or compete at specific locations along the value chain? (3) What contingencies shape the mix of cooperation and competition in multipoint settings?

Strategic groups and co-opetition. The co-opetition literature has yet to examine how different firms may present different arrays of advantages and disadvantages as potential co-opetive partners. The strategic groups concept could be very useful in this regard. A firm's own strategic group is one source of partners. Firms within a strategic group are similar along certain dimensions (such as marketing and product scope), and they may even develop a shared identity (Peteraf & Shanley, 1997). Cooperation along group-defining dimensions might be a valuable source of shared economies. Meanwhile, each firm may attempt to differentiate itself along dimensions that group members do not share.

Alternatively, partnering with a firm in another strategic group may be preferred. Cooperation between firms in different groups may allow each to develop new skills and flexibility via accessing complementary resources. Also, cooperation between such firms may be relatively stable because they are not close competitors. Key issues for future research include what leads a firm toward co-opetition with a fellow group member vs. a member of another group, the relative merits for competitive positioning and performance of each alternative, and whether a firm can effectively manage a network of co-opetitive relations both inside and outside the strategic group.

Regional clusters and multipoint competition. One of the driving forces behind regional cluster formation is the sharing of factor inputs and support industries available to firms at a specific location (Porter, 1998a, 1998b). An important unanswered issue is what prevents any given firm from monopolizing those inputs. Perhaps insight from the mutual forbearance concept used in studying multipoint competition can offer an explanation. The idea that firms refrain from attacking each other in markets for fear of retaliation in other markets could be extended to the supply side in a regional cluster where firms use many of the same inputs. For example, Firm A might forbear from buying all the supply of a raw material because, if it does, Firm B might retaliate by establishing an exclusive agreement with a local university which conducts much of the basic research for the cluster. Qualitative case studies could be used within regional clusters to examine the validity of this explanation.

Regional clusters and co-opetition. The preceding section argues that firms within regional clusters may forbear from monopolizing inputs because of the fear of retaliation by other cluster members. Another way to view this input-sharing dynamic is to model it as co-opetive relationships in which the firms intentionally cooperate to share inputs but still compete for customers. This is consistent with the idea set forth by Bengtsson and Kock (2000) that firms cooperate early in the value chain, away from customers, but compete nearer to the customer. This gives us at least two viable explanations for input dynamics in regional clusters, a situation that provides the foundation for future tests of competing hypotheses.

Multiple-stream studies. We have attempted to identify future research opportunities in competitive dynamics research by pairing various research streams and then deriving theoretically valuable problems and issues. Taking this approach one step further, studies might be conducted that combine more than two research streams. Indeed, Figure 1 suggests that such investigations are necessary for scholars to thoroughly understand how competitive advantages develop and why some firms outperform others. For example, above we wondered 'What contingencies shape the mix of cooperation and competition in multipoint settings?' The history of first moves between the firms and the nature of strategic groups in the relevant industries seem likely to influence the cooperation/competition mix. Our overall point is that multiple-stream research is likely to contribute more to the body of knowledge at this stage of literature development than single-stream studies. In particular, a multiple-stream research approach would be quite useful in identifying needed contingency and control variables (as in the example above) and in constructing critical tests of competing explanations for a particular phenomenon.

Conclusion

How firms compete is a core element of a capitalist economy. As such, research on competitive dynamics will continue to play an important part in understanding a firm's behavior in its changing environment. This research area has evolved from basic microeconomic models of competition to sophisticated theoretical frameworks that more accurately reflect the complexity of today's firms, markets, and industries. Based on our reading of the recent literature, our overall belief is that competitive dynamics research will make increasingly important contributions to the understanding of firm behavior and performance, especially if future studies simultaneously take into account variables from two or more of the research streams discussed here.

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