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THE EFFECT OF WITHIN-INDUSTRY DIVERSIFICATION ON FIRM PERFORMANCE: SYNERGY CREATION, MULTI-MARKET CONTACT AND MARKET STRUCTURATION

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This paper examines the effect of diversification upon intra-industry performance. We propose that intra-industry diversification promises three sets of benefits, which, separately and in combination, provide firms with a competitive advantage: synergies arising from economies of scope; premiums from mutual forbearance enabled by multi-market competition; and efficiencies derived from market structuration. The additive and integrative effects of the first two have not been explored. The benefits of market structuration remain untheorized and thus untested. The test of our theoretical model in the Canadian general insurance industry indicates that mutual forbearance provides advantage under specified conditions, that market structuration also provides advantages, but that diversification per se does not. Copyright © 2004 John Wiley & Sons, Ltd.

Strategic management theory seeks to understand the sources of sustainable competitive advantage (Rumelt, Schendel, and Teece, 1994). To this end, research has explored whether strategies of diversification are associated with organizational performance. To date, these studies have produced conflicting results (for reviews, see Datta, Rajagopalan, and Rasheed, 1991; Hoskisson and Hitt, 1990; Montgomery, 1994; Palich, Cardinal, and Miller, 2000; Pitts and Hopkins, 1982; Ramanujam and Varadarajan, 1989). Nevertheless, the logic underlying the anticipated link between diversification and performance remains compelling and warrants further explication. This paper builds upon previous literature in two ways. First, we look at *intra*-industry diversification, a hitherto neglected strategy. Almost all previous studies examined firms whose business activities span more than one industry. And yet, today, few industries do not contain diversified firms, i.e., that operate in more than one market niche within the industry. The prevalence of these firms raises the question of whether intra-industry diversification can explain differences in performance. The failure to examine intra-industry diversification is a curious omission in our understanding of the link between diversification and performance. This paucity of single-industry studies is a motivation of the present study.

Second, we give integrated attention to three potential benefits of diversification, which have previously been treated separately or ignored. By examining all three sets of benefits, we provide a richer and more dynamic analysis of the performance consequences of diversification than is currently provided in the literature. Our argument is that intra-industry diversification can result in three sets of benefits, which, separately and

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in combination, provide firms with a competitive advantage over non-diversified firms. One set of benefits can be gained without concern for the actions of other firms, namely, enhanced opportunities from a more optimal use of factors of production. In this sense, the competitive advantage from diversification can be achieved by a firm acting independently of its rivals. The implicit assumption in this line of theorizing is that the decision to diversify is to gain synergies (economies of scope) in the use of resources. As such, this argument is essentially economic in form.

A second set of potential benefits arises from opportunities to practice mutual forbearance. Diversification engenders multi-market contact between firms (Edwards, 1955). Multi-market contact, in turn, provides the opportunity for firms to dampen the effects of market forces by exercising mutual forbearance. Such collusion enables the capture of high returns (Baum and Greve, 2001). In this way, diversification and multi-market contact are complementary activities because the former provides the opportunity for the latter. Studies of multi-market competition thus introduce an alternative possible motivation for intra-industry diversification, namely, to strengthen a firm's negotiating position with rivals with whom it comes into contact. The clear, albeit implicit assumption of multi-market research is that the decision to diversify is driven by a firm's desire to tacitly coordinate activities among competitors. This is not to suggest, however, that all firms have either the motivation and/or the capability of doing so. On the contrary, Baum and Korn (1999) found multi-market presence to be more a function of chance than a strategy, and firms may lack the organizational capability to operate a mutual forbearance strategy (Golden and Ma, 2003). Nevertheless, diversification can lead to multi-market contacts between competitors, which, under specific circumstances, could lead to competition based upon mutual forbearance.

There is a nascent recognition of the need to combine multi-market contact and diversification (Gimeno and Woo, 1999), but the two approaches have yet to be appropriately examined together. The theoretical underpinnings of the first two of these benefits originated at different times and empirically they were examined independently of each other. Thus the additive and integrative effects of the two have not been explored. We propose that diversification and multi-market competition are theoretically inseparable and that the omission of one or the other leads to an incomplete theoretical explanation and the possibility of biased analysis and conclusions (Greene, 2003). Further, we suggest that incorporation of multi-market analysis is to be welcomed because it adds a dynamic aspect to understanding the consequences of diversification, by tracing the source of competitive benefits to the responses of firms to each other. As such, multi-market studies amplify understanding of how and why diversification can generate superior performance. At a minimum, multi-market explanations add to more traditional studies by proposing that the diversified firm may capture the benefits of mutual forbearance *in addition to* those achieved from economies of scope. Alternatively, the potential benefits of diversification may arise *only* from the ability to engage in mutual forbearance, which would imply that previous studies may have inappropriately explained how diversification provides competitive advantage. This latter position is, we acknowledge, highly unlikely, given that multi-market presence is not necessarily a deliberate strategy (Baum and Korn, 1999). But it is, nevertheless, a theoretically feasible possibility. Therefore, the emphasis in this paper is upon the integration of diversification per se with multi-market research promises to give a more complete theoretical explanation of the effects of diversification upon firm performance, within a single industry.

Diversification and multi-market competition assume that managers act strategically in their choice of markets. That is, there is an assumption of deliberate and informed agency. However, we propose a third set of possible benefits that may follow from the interaction of diversification and multi-market contact. Borrowing from Giddens (1979), we term these the benefits of market structuration. Market structuration is the process whereby initially separate market niches mature into 'related' market niches with supporting institutional infrastructures. The relatedness of market niches is a function of social processes and beyond the control of individual firms. As we will note, these processes occur concurrently with the actions of firms and, in this sense, are both a consequence of those actions but also serve to shape them. Supporting institutional infrastructures in the industry, once developed, offer efficiency advantages to all firms functioning in the same markets, although

each firm may enjoy these benefits to different extents. That is, the benefits of market structuration are collective, not proprietorial to one or pairs of firms. To date, these benefits have been ignored in studies of diversification, probably because they occur more readily *within* an industry. Including the effects of structuration processes within our framework is thus highly appropriate given our focus upon intra-industry effects, and provides a more sociological account of how diversification provides competitive advantage.

The twin purpose of this paper is thus to develop and test empirically the effects of intra-industry diversification upon performance, *and* to examine which of three benefits is producing the effects.

The paper is arranged as follows. The next section highlights the differences between intra- and inter-industry diversification and then discusses in turn the three sets of benefits provided by diversification. The procedures for testing these ideas are detailed in the Methods section. The final section provides and discusses the results, reiterating the importance of combining diversification analysis with multi-market analysis.

DIVERSIFICATION AND PERFORMANCE

Inter- and intra-industry diversifications

The relationship between organizational performance and intra-industry diversification cannot be readily inferred from studies of inter-industry diversification, for both theoretical and methodological reasons. The theoretical objection to such an inference rests on the reasons why diversification improves performance. Specifically, two of the three benefits introduced above (and developed more fully in a moment), are highly unlikely to occur *to the same degree* across industries as they are in a single industry. The potential for mutual forbearance and market structuration are much more significant within an industry, which means that the link between diversification and performance could thus be very different in the two settings.

There are also methodological reasons for not extrapolating results garnered from one sampling design (multi-industry) to another (intra-industry). First, prior research on the link between multi-industry diversification and performance examined whether related *and/or unrelated diversification* across industries provides performance advantages. Samples consisting of multi-industry firms were thus suitable because they enabled researchers to compare the performance contributions of related and unrelated diversification. However, because products and services produced within the same industry are related in their use of similar input factors and customer markets (Chen, 1996), firms that operate in several markets within the industry are *de facto* adopting the strategy of related diversification.[1] It is thus questionable whether we can infer from advantages of related and unrelated diversification observed in multi-industry settings, that the same advantages would be found in single industries. A single-industry sample is needed to answer whether *the degree of related diversification into market niches still explains performance differences.*

Second, Short, Ketchen, and Palmer (2002) emphasize the need to draw research samples that closely mirror the population to which the central research question and conclusions are addressed, which can be achieved by purposive sampling (Kerlinger and Lee, 2000). In our case, this means examination of firms within a single industry. Third, a single industry sample is a sample with *restriction in range*, in comparison to a multi-industry sample (Johns, 1991). Statistical tests in a restricted sample are conservative (Johns, 1991). Therefore, it is more difficult to identify a significant relationship between diversification and performance in a single industry sample than in a multi-industry sample.

Given these arguments, it is worth noting that few intra-industry studies exist. Table 1 summarizes papers on the diversification–performance relationship that appeared in four leading journals (*Administrative Science Quarterly, Academy of Management Journal, Strategic Management Journal*, and *Organization Studies*) from 1997 to 2001. Not one study looks at intra-industry diversification. A similar conclusion is reached from re-examination of 82 studies of the diversification–performance relationship published between 1971 and 1997 and included in a meta-analysis by Palich *et al*. (2000). Although Palich *et al*.'s

[1] In Rumelt's (1974) diversification categories, firms that diversify into different market niches in the same industry are either related diversifiers or dominant business diversifiers, but not unrelated diversifiers or single business adopters.

Table 1. Empirical analysis of the linkage between diversification and firm performance

Author	Research context
Amihud and Lev (1999)	Literature review on empirical studies
Bergh (1997)	453 unrelated acquisitions in 1977; 411 unrelated acquisitions in 1987
Brush, Bromiley, and Hendrickx (1999)	535 3-segment firms and 173 4-segment firms during 1986–95 (*COMPUSTAT* data)
Busija, O'Neill, and Zeithaml (1997)	47 *Fortune* 500 firms during 1978–84; 95 *Fortune* 500 firms during 1983–87
Chang and Hong (2000)	12,019 observations of 1248 companies associated with 317 business groups as of 1996 in Korea during 1985–96
Chang and Singh (2000)	709 public firms in the manufacturing sector (*TRINET* data)
Delios and Beamish (1999)	399 Japanese firms in 1996
Delios and Beamish (2001)	3080 subsidiaries of 641 Japanese firms during 1987–96
Farjoun (1998)	158 *Fortune* 500 in 1985 (*TRINET* data)
Geringer, Tallman, and Olsen (2000)	108 largest Japanese manufacturing multinationals during 1977–93
Hitt, Hoskisson, and Kim (1997)	295 manufacturing firms with sales exceeding $100 million during 1988–90 (*COMPUSTAT* Data)
Khanna and Palepu (2000)	30 group affiliated firms, and 80 unaffiliated firms during 1988–96
Krishnan, Miller, and Judge (1997)	147 acquisitions during 1986–88
Sharma (1998)	195 acquisitive entries and 130 de novo entries made by *Fortune* 500 firms during 1980–82 (*TRINET* data).
Sharma and Kesner (1996)	216 *Fortune* 500 firms during 1980–82 (*TRINET* data)
St John and Harrison (1999)	Sample sizes vary with hypotheses and analysis methods, and are in the range of 150–300 firms (*COMPUSTAT* data)
Stimpert and Duhaime (1997)	160 *Fortune* 500 firms during 1984–86 (*COMPUSTAT* data)
Vermeulen and Barkema (2001)	25 firms during 1966–94
Zahra, Ireland, and Hitt (2000)	321 firms in 12 high-tech industries

review included single industry studies (Hill and Hansen, 1991; Imel and Helmberger, 1971; Johnson and Thomas, 1987; Mosakowski, 1997; Palepu, 1985), the reason why they focused upon one industry was because of data availability or to control for industry effect. Nevertheless, no study, to our knowledge, has specifically examined the theoretical and methodological differences of single and multiple industry samples.

Synergy creation via intra-industry diversification

Several arguments are put forward to explain how and why diversification can generate higher profits. Most of these arguments are related to the resource-based view of the firm (Schilling and Steensma, 2002). Specifically, a firm is viewed as a bundle of resources, which has the propensity to become disproportionate in relation to the existing level of production (Penrose, 1959). That is, some resources are usually in oversupply. Penrose suggests that when faced with an excess of a particular resource, such as marketing and technological know-how, a firm has an *internal* incentive to diversify in order to realize benefits from exploiting the excess resource. For example, consider that a given firm possesses two resources, x and y, one of which, x, is in oversupply. Because resource x is in oversupply, the firm can diversify into new activities so that resource x (e.g., managerial skills) is fully exploited. However, to support the new level of production, the firm may have to apply more of resource y (e.g., a marketing channel). The resource relatedness between x and y is maintained in the expanded firm in the sense that the newly increased resource y facilitates the further use of resource x. Furthermore, the level of relatedness between the two resources can deepen in the expanded firm if the firm discovers a new application of simultaneously utilizing resources x and y in the new business arena. In short, resource relatedness is a basic assumption in the resource cross-exploitation argument.

The resource-based view of the firm further suggests that the benefits received from making use of overly abundant resources are contingent upon the resources being scarce, valuable, inimitable, and unavailable for purchase at a cheaper cost by a non-diversifier (Barney, 1991; Markides and Williamson, 1996; Wernerfelt, 1984). Moreover,

these resources are usually so firm-specific that they cannot be utilized outside of the firm and are thus difficult to sell owing to imperfect divisibility (Teece, Pisano, and Shuen, 1997). The emphasis of firm specificity in resources suggests that resources can be exploited in a firm-specific and potentially synergistic way. Hence, resource redeployment is typified by the specific manner in which these scarce, valuable, and inimitable resources are combined. It is a result of these features that some degree of sharing of resources across market niches can be applied with proportionately smaller increments in cost. Therefore, diversification can reduce overall operating costs and induce economies of scope.

Penrose's logic and the arguments of the resource-based view reveal the nature of the performance consequences of diversification. Specifically, synergies in general, and economies of scope in particular, arise when imperfectly divisible resources are used to produce two or more products. To some extent, economic rents contributed by diversification are sourced from the amortization of underutilized resources applied over a broader base. However, the relationship between diversification and performance may not necessarily be linear and positive. Previous research into multi-industry diversifiers suggests there are limits upon any benefits accruing from synergies in the use of resources. Attempts to funnel increasing numbers of activities through common resource chains can result in poorer performance as a consequence of 'congestion' (Teece, 1982). Nevertheless, in our research setting of intra-industry diversification, the congestion from the multiple uses of common resources is less likely to emerge, in comparison to inter-industry diversification, because different market niches in the same industry are related by similar customer groups and input factors. Consequently, we expect that intra-industry diversification will create potential benefits when the costs to a single firm of producing a particular level of output for each of several intra-industry market niches, are lower than the summed costs of separate firms, each producing at the given output level for a single market niche (Gimeno and Woo, 1999; Tirole, 1988). Thus:

> *Hypothesis 1: Intra-industry diversification is positively associated with firm profitability.*

A weakness of this conceptualization is that it ignores the behavior of competitors. That is, studies in this tradition assume potential benefits are *solely* determined by a firm's ability to select favorable industries/intra-industry market niches within which to deploy a superior resource stock. According to this portrayal, superior returns result from decisions of the firm, without reference to interactions with competitors. Inevitably, however, a strategy of diversification raises the possibility that a firm will come into multiple contacts with its competitors, which, in turn, highlights the potential influence of multi-market interaction.

Multi-market competition within an industry

Multi-market contact (MMC) is the extent to which a firm's market niche dispersion corresponds to that of other firms (Greve and Baum, 2001). Close correspondence in market structures raises the possibility of collusion between firms because it enables them to avoid the full rigors of competition by practicing 'mutual forbearance.' Edwards (1955) was the first to propose that multiplicity of contact among firms is conducive to mutual forbearance:

> The interests of great enterprises are likely to touch at many points, and it would be possible for each to mobilize at any one of these points a considerable aggregate of resources. The anticipated gain to such a concern from unmitigated competitive attack upon another large enterprise at any point of contact is likely to be slight as compared with the possible loss from retaliatory action by that enterprise at many other points of contact ... Hence there is an incentive to live and let live, to cultivate a cooperative spirit, and to recognize priorities of interest in the hope of *reciprocal recognition*. (Edwards 1955: 335, emphasis added)

While Edwards emphasized that MMC can deter aggression, Simmel (1950) acknowledged that it promotes the tit-for-tat exchange of dominance. This phenomenon of reciprocal compromise is elsewhere referred to as *linked oligopoly* (Bulow, Geanakoplos, and Klemperer, 1985; Martinez, 1990; Solomon, 1970) in which competing firms recognize their 'fate interdependence' (Hughes and Oughton, 1993) and adopt 'spheres-of-interest' agreements (Kantarelis and Veendorp, 1988). Karnarni and Wernerfelt (1985) maintain that the 'mutual footholds' of rival firms in each other's

strongholds are conducive to a collusive equilibrium. Further, MMC can reach a stage at which a given firm and its rival keep each other mutually hostage (Karnani and Wernerfelt, 1985). Formally, the mutual forbearance hypothesis states that multiple points of competition blunt the intensity of competitive behavior, resulting in artificially high prices and profits. Thus:

> *Hypothesis 2a: The number of market niches in which a given firm meets with its rivals across all market niches is positively related to this firm's profitability.*

Some studies (e.g., Evans and Kessides, 1994; Fernández and Marín, 1998; Jans and Rosenbaum, 1996; Parker and Röller, 1997; Singal, 1996) support the above hypothesis and find that MMC increases profitability, although contradictory findings do exist (Mester, 1987; Sandler, 1988; Scott, 1982). The lack of consistency of results has led some researchers to identify critical assumptions underlying much MMC research (Spagnolo, 1999). Golden and Ma (2003) emphasize that firms may lack the organizational capability to formulate and implement a strategy of mutual forbearance. Specifically, they point to the importance of mechanisms that *enable* cooperation within a firm, and of incentive systems that induce cooperative behavior. We address this concern in the Methods section. Baum and Korn (1999) raise the importance of motivation, noting that the mere presence of multi-market contacts does not necessarily imply a proactive multimarket competitive strategy. This idea, we suggest, is implicitly embraced by Jayachandran, Gimeno, and Varadarajan's (1999) proposition that mutual forbearance depends upon familiarity among rivals. That is, mutual forbearance is predicated on the assumption that firms not only know who are their multi-market competitors, but also that they know how those firms might behave if faced with aggressive competition or implicit offers to collude. In some instances, the assumption of familiarity is reasonable, as, for example, in the airline industry (Baum and Korn, 1996; Evans and Kessides, 1994; Gimeno, 1999; Sandler, 1988). Nevertheless, familiarity cannot be taken for granted in all settings.

Several factors influence inter-firm familiarity. The difficulty of identifying competitors and assessing their likely behaviors increases exponentially as the number of players increases (e.g., Gibbons, 1992). Large numbers of rivals, especially if they occur in multiple market niches, make it difficult for a firm to monitor current behaviors and/or estimate likely future responses (Lant and Baum, 1995; Porac and Thomas, 1990). Familiarity is also difficult in cases where the industry is highly fragmented and rivals are relatively undifferentiated (Brown and Eisenhardt, 1998; Ferrier, Smith, and Grimm, 1999). Third, familiarity is undermined if markets are constantly changing and characterized by shifting competitive patterns (D'Aveni, 1994; Li and Chuang, 2001). In short, when information overload occurs because of too many rivals or too many (or unpredictable) battlefields, the difficulty of gaining reliable intelligence makes forbearance riskier and thus less likely.

Familiarity between two firms may be acquired from competitive interactions. These interactions prompt firms to realize that their strategic actions and fortunes are intertwined. Jayachandran *et al*. (1999) summarize several processes by which familiarity evolves multi-market presence towards adoption of mutual forbearance. First, an accumulated memory of 'war stories' deepens mutual understanding of the other's ability and willingness to retaliate, and of commonly used tactics. Second, growing familiarity with a rival leads to an information advantage: that is, it prompts a firm to collect relevant information about the rival's current strengths and weaknesses. This increasing intelligence equips the focal firm with the potential, if provoked, to engage in effective cross-market retaliation so as to deter the rival firm's progress. As firms appreciate their mutual potential for effective retaliation, their willingness to mutually forbear increases. Third, familiarity with a rival makes that competitor more salient, and, as a result, worthy of more attention. Attentiveness toward a rival then heightens awareness of the potential risk of competitive retaliation, which, in turn, leads a firm to avoid initiating aggressive competition.

We argue that the ability to decode a rival's motives and likely competitive actions is facilitated if the rival firms are similar in terms of their size and the full range of their market niches. That is, when two firms of similar size deploy resources in similar market niches they are more likely to receive feedback from the same stakeholders, such as customers and suppliers. Moreover, they

are more likely to cultivate the same pool of input factors, such as raw materials and human resources. Consequently, not only do the two rival firms receive similar market information, but also they are inclined to signal their intentions to the marketplace in a comparable manner. Further, they can empathize more with each other's situation and thus have a deeper appreciation of their respective weaknesses and strengths because they have the same market vulnerabilities. Essentially, similarity between firms leads to a higher understanding of respective strengths and vulnerabilities and acts as a reciprocal hostage device deflecting firms from excessively aggressive behaviors.

In contrast, firms dissimilar in size and market range are less likely to fully understand the other's position and, in any case, will not be subject to the same vulnerabilities (Baum and Korn, 1999; Chen, 1996; Chen and Hambrick, 1995). For example, a smaller firm may assume that a bigger firm will ignore it as a competitor; therefore, the smaller firm may compete aggressively, expecting scant responses from its bigger rival. Microbreweries, for example, are often ignored by mass production breweries. However, larger firms, once provoked, become determined to overwhelm the smaller firm with countermoves, assuming that the smaller firm cannot retaliate effectively. Dissimilarity between firms can also breed misunderstanding of strategic actions. Lack of experience of a competitor's situation makes it difficult for a management team to make sense of that competitor's strategic moves. Finally, MMC between dissimilar firms may fail to deter competitive aggression because neither understands the most effective potential deterrence (for example, in which market niche a firm can inflict the most harm and which market niche is most important to the rival). Thus:

> *Hypothesis 2b: The more similar a firm is to its rivals, the stronger the positive association between the firm's MMC with its rivals and the firm's profitability.*

Industry-level market structuration

Thus far we have discussed the separate effects of intra-industry diversification and MMC. Diversification, we noted, affects performance by creating opportunities for achieving synergies from economies of scope. Multi-market presence, on the other hand, which is a consequence of diversification, affects performance by creating opportunities for collusion, irrespective of any benefits from synergies. To date, however, these two sources of competitive advantage have not been examined together. Consequently, we do not know whether diversification is associated with higher performance *because of* the opportunities for economies of scope, *and/or* because of the opportunities for mutual forbearance. These effects need disentangling. But there is another, hitherto neglected issue that follows from the possible interaction between diversification and MMC. As firms in the same industry diversify and engage in MMC, does this affect the structure of market niches? In the next section we propose that it does. We begin discussion of this third set of benefits by exploring further the notion of 'relatedness,' which is fundamental to the concepts of synergy and MMC.

The social construction of relatedness between market niches

The most basic conceptualization inherent in the phrase 'related market niches' refers to a certain level of connection between business operations in two market niches. Intuitively, when many firms operate simultaneously in two market niches they will understand how to coordinate operations in and across them. We thus propose a 'state-defined' (cf. Collins and Ruefli, 1996) argument: *The greater the number of firms that concurrently operate in the same market niches, the more related the set of market niches becomes*. In other words, the relatedness of market niches is shaped by the density of firms engaged in the same patterns of market activity. The greater the number of firms operating in the same set of market niches, the greater the efficiency and legitimacy of that particular diversification strategy. In other words, we argue that the structuration of organizational fields reinforces the degree of 'relatedness' between the market niches.

In raising market structuration as a source of competitive advantage, we are following the insights provided by White (1981) and neo-institutionalists such as DiMaggio and Powell (1983). White's critical insight was that markets are not 'out there' but are cognitively constructed by the interactive behaviors of producers. The collective actions of firms, in other words, 'create'

markets, much as the repeated trampling of ground results in pathways. Building upon Giddens (1979), DiMaggio and Powell make a related point, which is that social structures are both the determinants and outcomes of reflexive behavior. Social actors are constrained in their actions by their place within a framework of social norms and routines, but in the act of 'doing' they both reproduce and yet recreate that framework. This duality of social structure—the iterative interplay of structural constraint and reflexive choice—is the process of structuration. Applied to market niches in the same industry, we propose that firms socially construct interlocking market niches, which as they mature (i.e., more firms enter them) become legitimated and reinforced by supporting institutional infrastructures. According to this logic, market niches initially appear as firms tentatively negotiate market opportunities. As the actions of others confirm and consolidate those opportunities, social processes begin to routinize interactions but, more critically, provide collective potential benefits. Three social processes are particularly significant: inter-firm learning, support structures, and legitimation.

Inter-firm learning

When many firms simultaneously operate in a given configuration of market niches, inter-firm learning takes place because of exchanges of personnel between firms (Hall, 2002), the development of friendship networks that cross firm boundaries (Ingram and Roberts, 2000), the influence of trade associations (King and Lenox, 2000), the increased likelihood of inter-board linkages and strategic alliances (Westphal, Gulati, and Shortell, 1997), and inter-firm imitation (Baum, Li, and Usher, 2000; Haunschild, 1993). In essence, the organization field matures through processes of structuration (DiMaggio and Powell, 1983). All these organizational field-level interactions contribute to the diffusion of 'logics of action' (Jepperson, 1991), which become shared. These logics define how to function successfully in the same set of market niches. Because cognitive limits of managers restrict the range of businesses and products that most managers can comprehend, these field-level learning processes reduce the search costs for appropriate organizational routines. Consequently, these processes rationalize and tighten the level of association between intra-industry market niches, and subsequently become germane to the emergence of economies of scope in the marketplaces.

Support structures

As the cognitive connections between two market niches spread, the diffusion of knowledge on how to produce concurrently in the two market niches is reinforced and attracts an infrastructure of support services. For example, suppliers of inputs (e.g., material suppliers) become motivated to commit resources for research and production in order to manufacture materials that complement each other in the separate market niches, so as to fulfill the needs of their customers. Saxenian (1994) describes this process whereby a supportive infrastructure of firms (suppliers of raw materials, venture capitalists, lawyers, etc.) evolved alongside the increasing density of high-technology firms in the evolution of Silicon Valley. In effect, as more firms simultaneously operate in particular markets, sufficient demand is generated for the emergence of support services, which in turn reinforce the practicality of operating in those market niches. Further, the particular combination of market niches becomes perceived as legitimate, even natural, and attracts attention and analysis. Universities and professional training institutions analyze how to efficiently function concurrently in these market niches. Students or trainees pressure educational institutions to generate and teach such knowledge because it advances their career prospects within the industry. For example, as the advantages of network forms of organization, as practiced by biotechnology firms, became widely known, educational institutions turned attention to understanding them so as to incorporate them into their syllabi (Powell, Koput, and Smith-Doerr, 1996). Thus, intra-industry market niches become technologically complementary, are reinforced by stabilizing institutions, and provide the basis of a self-reinforcing organizational field. Critically, as the infrastructure of support services both grows and advances along the learning curve, the efficiency of the field improves. As a result, the unit costs of operating simultaneously in the different market niches are driven down and capturing synergies becomes realistic.

Legitimization

When sufficient firms of the same industry fully operate in a set of market niches, the legitimacy of doing so increases. This argument is consistent with both ecological theory (Hannan and Freeman, 1989) and institutional theory (Tolbert and Zucker, 1996). Routines, rules, and regulations emerge to facilitate the intra-industry diversification strategy. Market analysts and observers publicize success and contribute to a growing social consensus that firms 'should' function in this way. As the strategy becomes taken-for-granted the burden of convincing outside stakeholders falls away. Stakeholders, such as banks or suppliers, that control key resources are less questioning of firms that operate across the market niches. The chances of success in soliciting support from stakeholders thus increase. This is the argument underlying the emergence of the multidisciplinary practice in the delivery of professional services (Greenwood, Suddaby, and Hinings, 2002). In short, the taken-for-granted legitimacy of a set of markets lowers the costs of acquiring input factors and of attracting consumers. In an extreme situation, firms may suffer from *not* conforming to a legitimized mode of production. Consumers may expect and demand that firms provide products or services simultaneously in the two market niches (Montgomery and Wernerfelt, 1992; Wernerfelt, 1988).

In summary, the essence of our state-defined argument is that once sufficient firms simultaneously operate in a set of markets, institutionalized infrastructures will develop. That is, as more and more firms operate concurrently within a given set of market niches, they attract a supporting infrastructure that begins to routinize the markets and reinforce commitment to them. Institutionalized infrastructures, once developed, lower the costs of production and provide the bedrock for the relatedness of the market niches. Here, in other words, is the link between diversification and multi-market competition. By attempting to leverage superior organizational resources across several market niches, a firm engages in multi-market presence. Multi-market presence, as it evolves, can *create* relatedness between the market niches. Whether relatedness actually occurs *depends upon the density of firms involved*. That is, as more and more firms adopt a particular configuration of markets they will collectively benefit from complementary technologies, the availability of educated personnel, the growth of inter-firm knowledge transfer, and enhanced legitimation. These we call the *benefits of market structuration*. Consequently, the conjoint pattern of diversification of *all* firms has an impact on the achievement of synergy within a given firm: As relatedness develops, the performance of a firm improves because it potentially benefits from synergies arising from field structuration.

A formal definition of relatedness

Because there is no consensus in the strategic management literature on how to adequately define the 'relatedness' of market niches (Davis *et al.*, 1992; Farjoun, 1998; St John and Harrison, 1999; Stimpert and Duhaime, 1997), our arguments are vague and incomplete without a concrete method for calculating the degree of relatedness between market niches. To address this issue, we apply Sohn's method (2001) to generate the relatedness index between Market niches k and l:

$$r_{kl} = \frac{\sum_{i=1}^{I} w_k \min(c_{ki}, c_{li})}{\sum_{i=1}^{I} w_k c_{ki}} \qquad (1)$$

where c_{ki} was Firm i's revenue from Market niche k, c_{li} was Firm i's revenue from Market niche l, w_k is the total revenue collected by all firms from Market niche k, and I is the total number of firms.

Sohn's (2001) formula is a fine-tuned version of Jaffe's cosine measure for technology niche similarity, a measure commonly used in economics research (e.g., Jaffe, Trajtenberg, and Henderson, 1993). Sohn's method has several advantages. First, this method incorporates the intuitive idea that when more firms choose to operate in two market niches, the more related these market niches become. In particular, when Firm i does not operate in Market niches k and l concurrently, the term $\min(c_{ki},c_{li})$ in Equation 1 is zero. Second, the three parameters used in Equation 1, w_k, c_{ki} and c_{li}, are information about the market choices by all firms. The relatedness measure for two market niches is totally determined by the amount of business activities of all firms in these market niches. In other words, the market niche relatedness index is derived solely from the pattern

of diversification and multi-market contacts of all firms. Third, w_k, which was used as a weight in Equation 1, accounts for the importance of Market niche k, which is generally referred to as niche width in the organization theory literature (Freeman and Hannan, 1983). As a result, the niche width issue is accounted for in Sohn's method. Finally, Sohn's method allows for asymmetry of market niche relatedness indexes. In other words, r_{kl} does not necessarily equate to r_{lk}. Market niche size asymmetry between two market niches makes it possible for a scenario in which all firms active in a very small market niche are also active in the largest market niche, but the largest market niche contains many other firms that have no businesses in the small market niche.

In short, market niches become related as more and more firms concurrently conduct business within them. For instance, many insurance companies approach large institutions to provide insurance for their commercial property. Some Canadian organizations (e.g., universities) will only use firms that can also insure their automobiles and their personnel. This practice has cajoled some insurance firms to broaden their insurance portfolio, either by forming consortia or through a merger/acquisition. The interplay between diversification and multi-market overlap generates the potential *benefits of market structuration*. Our argument is consistent with prior research that examines the conceptualization of intra-firm business activity coherence, such as Teece *et al*.'s (1994) 'survivor principle,' which dictates that economic competition will lead to the disappearance of relatively inefficient organizational forms. According to Teece *et al*., 'if corporations which engage in activity *A* almost always also engage in activity *B*, we would conclude that these activities are highly related' (Teece *et al*., 1994: 5). Thus:

> *Hypothesis 3: The correspondence of diversified firms' configurations of market niche choices shapes the degree of market niche relatedness. Firms that diversify into related market niches have higher firm profitability.*

METHODS

Research setting

Our research setting is the general insurance industry in Canada from 1993 to 1998. The data cover 276 general insurance companies. General insurers, also called property and casualty insurers, sell any insurance other than health and life insurance. Data were provided by Trac Insurance Service Ltd. (now A. M. Best Ltd.), the major independent Canadian insurance rating agency. Trac Ltd. sourced its data from the annual statements filed by insurers with the Office of the Superintendent of Financial Institutions Canada (OSFI). To explore the extensiveness and correctness of the data, we compared them with data provided by Stone & Cox Ltd., one of the oldest publishers in the Canadian insurance industry. The sample of 276 insurers represents over 95 percent of general insurers in Canada from 1993 to 1998 (Annual Report of OSFI, various years). Firms not included in the sample are either inactive or very small insurers. Firms that had monopoly status (e.g., several provinces in Canada did not issue automobile insurance licenses to more than one company) were excluded.

The data contain the breakdown of written insurance policy premiums from 17 product lines in the then 12 provinces and territories of Canada. The 17 product lines are derived from the insurance categories defined by the Insurance Companies Act of Canada (1991): property–personal, property–commercial, aircraft, automobile, boiler and machinery, credit, fidelity, hail, legal expense, liability, mortgage, surety, title, marine, accident and sickness, reinsurance assumed, and reinsurance ceded. Thus, in total there are 204 (i.e., 17 markets $\times$ 12 geographical areas $=$ 204) market niches in the Canadian general insurance industry. In addition, the data contain information on the written insurance policy premiums of each insurer derived from foreign countries. Although few insurers had premiums in this category, which comprised less than 0.05 percent of total premiums, we included the category because of the different logistical requirements for insurers to sell insurance policies outside Canada. Therefore, there are 205 market niches in our data.

Because our study examines intra-industry diversification, the validity of our definition of the industry boundary is important. The *Canadian Insurance Act* defines the boundary of the Canadian general insurance industry by clearly defining which firms are general insurance firms and the products that they can sell. In addition, there is no ambiguity about the boundary of the Canadian

general insurance industry among industry stakeholders. The industry has its own trade association (*Canadian Insurance Forum*). Moreover, the two premier trade magazines, *Canadian Underwriter* (published by Wadham Publications) and *Canadian Insurance* (published by Stone & Cox Ltd.), each publish annual lists of firms active in this industry. There is no ambiguity or conflict between the two lists. Furthermore, insurance programs at Canadian universities and insurance textbooks (e.g., Vaughan and Vaughan, 1999) define the general insurance industry in the same manner as we do here.

The industry experienced intense competition during our study period. At the end of 1993, the leverage rate of general insurers stood at 2.5 : 1, i.e., they had reserves sufficient to issue premiums up to $28 billion, but only issue premiums of $14.8 billion (Praskey, 1994). Further, the industry is not dominated by an oligophy: the market leader, CGU Group Canada Ltd., held only 8.76 percent of premiums by value in 1998 (Cudlipp, 1999). None of the firms in our sample were subject to price control, although there were strict guidelines by regulators with regard to different statutory ratios (see the later section on control variables for details). Provincial boundaries are not a restraint upon competition as firms can easily register in all provinces except for auto insurance in two provinces; therefore auto insurance in these two provinces was excluded from our analysis.

Dependent variable

In order to compare our analysis with previous research, we chose rate of return before tax (ROA) as the indicator for firm performance, a usual indicator in diversification research. The OSFI defined the ROA in the general insurance industry as net income before taxes divided by average capital, surplus, and reserves. To avoid causal ambiguity, all of our independent variables and control variables were measured in year t, and the dependent variable was measured in $t + l$.

Analysis model

Our data have a cross-sectional time series structure with each insurer as a panel spanning a 6-year period. Therefore we use the following panel data analysis model:

$$y_{it} = \alpha + x_{it}\beta + \upsilon_i + \varepsilon_{it}$$

where x_{it} is a matrix of explanatory variables, υ_i is the firm-specific residual, and ε_{it} is a standard residual (mean zero, homoskedastic, uncorrelated with itself, υ_i and the x matrix). The above equation could be analyzed by the fixed-effects model or the random effects model. A fixed-effects model assumes that the firm-specific residual has a variance of zero, implying that the firms in the sample remain unchanged across all the years under investigation. The assumption inherent in a random effects model in panel data analysis stipulates (1) that each observation of a particular firm be drawn randomly at some early date from an unobservable underlying population, and (2) that the firm-specific residual has a distribution with a variance of $\sigma_\upsilon{}^2$. Because of the different assumptions used in the fixed-effects model and random effects model, results generated from the fixed-effects model cannot be extrapolated to a time period outside of the sample period. In comparison, results from the random effects model can be generalized to a longer time span. Application of the Hausman test confirmed no significant differences between the random effects model and the fixed-effects model. Therefore, we reported the random effects model only.

Preliminary analyses conducted to test the extent of autocorrelation of ROA revealed no significant autocorrelation, indicating that the competitive advantage of an insurer dissipated due to the competitive nature of the industry (Li and Chuang, 2001).

Independent variables

Entropy measure of diversification

The entropy measure, originally proposed by Berry and colleague (Berry, 1974; Jacquemin and Berry, 1979), has proven a valid measure of a firm's market niche dispersion (Hoskisson *et al*., 1993) and is used here. Although other measures exist (Davis and Thomas, 1993; Hall and John, 1994), the entropy measure has become the standard for research into the link between diversification and performance (Hill, Hitt, and Hoskisson, 1992; Hitt, Hoskisson, and Kim, 1997; Palepu, 1985).

The entropy measure, denoted *Entropy measure of diversification*, is calculated as follows:

$$\textit{Entropy measure of diversification} = \sum_{k=1}^{205}[p_{ik} \times \ln(1/p_{ik})] \quad (2)$$

where p_{ik} is the percentage of premiums collected by Firm i in the kth market niche ($k = 1, 2, \ldots, 205$). Hypothesis 1 predicts that the coefficient of this variable is positive.

MMC per rival

For each focal insurer, a variable, denoted by *MMC per rival*, is created to record the number of market niches in which the focal firm competes with its rivals. It is calculated by:

$$\textit{Average MMC per rival} = \frac{1}{\textit{No. of } j}\sum_{j \neq i} MMC_{ij} \quad (3)$$

where MMC_{ij} is the number of market niches shared by Firms i and j, and *No. of* j is the total number of firms sharing at least one market niche with Firm i. Hypothesis 2a proposes that the coefficient of this variable is positive.

Similarity weighted MMC per rival

It is not difficult for an insurer to become familiar with a rival insurers' offerings because all pricing and portfolio information of rival insurers is openly available as a consequence of regulatory filing requirements. Therefore, gaining intelligence about competitors is neither expensive nor difficult. However, an insurer is more likely to be especially attentive to insurers of similar size and which have similar insurance portfolios, because they face similar regulatory requirements (e.g., for reserve policies in different insurance businesses), attract similar types of customers, and compete for similar types of input factors (e.g., human resources, actuarial talents).

We calculated a MMC measure, weighted by the similarity between two firms in cultivating the same locations of industry resource space. This is our index of *Similarity weighted MMC per rival*:

$$\textit{Similarity weighted MMC per rival} = \frac{\sum_{j \neq i}(MMC_{ij} \times s_{ij})}{\textit{No. of } j} \quad (4)$$

where MMC_{ij} is the number of markets shared by Firms i and j, *No. of* j is the total number of firms which engage in MMC with Firm i, and s_{ij} is the niche overlap index calculated by Sohn's (2001) method:

$$s_{ij} = \frac{\sum_{k=1}^{205} w_k \min(p_{ik}, p_{jk})}{\sum_{k=1}^{205} w_k p_{ik}} \quad (5)$$

where p_{ik} is the proportion of Firm i's insurance premium collected from the kth market niche, p_{jk} is the proportion of Firm j's insurance premiums collected from the kth market niche, and w_k is the total premium collected by all firms from the kth market niche.

Essentially, the *Similarity weighted MMC per rival* is the variable of *MMC per rival* weighted by s_{ij}. We can also view the variable of *Similarity weighted MMC per rival* as the interaction term between s_{ij} and the variable of *MMC per rival*. Hypothesis 2b proposes that the coefficient of *Similarity weighted MMC per rival* is positive.

We entered s_{ij}, denoted as *Firm similarity*, into our analysis as a control variable, for two reasons. On the methodological side, it is usually recommended that the component variable of an interaction term be entered into the regression along with the interaction term, so that the effect of the interaction term can be teased out from its components (Evans, 1991). On the theoretical side, Deephouse (1999) suggests that the similarity of a given firm with its rivals in terms of market-niche choice may have an impact on its performance.

Relatedness weighted diversification

A variable, denoted by *Relatedness weighted diversification*, is calculated to operationalize Hypothesis 3. We suggest that related diversification refers to the 'relatedness' of market niches as revealed by patterns of strategic behavior—'related' means that there is a very close consistency between the market niches served by competitors. In particular,

we used:

$$\textit{Relatedness weighted diversification} = \sum_{k=1}^{205}\left(p_{ik}\sum_{l\neq k}^{205} r_{kl}\right) \quad (6)$$

where p_{ik} is the proportion of Firm i's insurance premium collected from the kth market niche. We used Equation 1 to derive r_{kl}, the 'relatedness' index between Markets k and l. In Equation 6, the term of p_{ik} can be solely determined from Firm i's own managerial decisions, therefore p_{ik} is an indicator of Firm i's portfolio diversification. In contrast, the term $\sum_{l\neq k}^{205} r_{kl}$ is the summation of Market k's relatedness with all other market niches in the insurance industry. Essentially the term $\sum_{l\neq k}^{205} r_{kl}$ is a summary indicator for the portfolio diversification of all insurers. The multiplication of p_{ik} by $\sum_{l\neq k}^{205} r_{kl}$ in Equation 6 suggests that the effect of p_{ik} on Firm i's performance depends on the degree of market niche overlaps with other insurers. Our operationalization of *Relatedness weighted diversification* closely corresponds to the meaning of an interaction term, that is, the independent variable's impact on a dependent variable is subjected to the level of another independent variable (Aiken and West, 1991). In this sense, Equation 6 corresponds closely to our argument that intra-industry market structuration depends on the interplay between a firm's diversification and the patterns of firms' multi-market overlaps.

Control variables

Following Jayachandran *et al*. (1999), we see mutual forbearance as dependent upon familiarity. Golden and Ma (2003) propose a further precondition for mutual forbearance, namely, that executives have appropriate *intra*-organizational mechanisms in place both to facilitate coordination across business units, and to reward cooperative effort by business unit executives. In the general insurance industry, these conditions are integral because the basic logic of an insurance firm is to spread risk across clients *and* different product lines (Vaughan and Vaughan, 1999). Achieving coordination across different service lines is thus part of the daily actuarial practices crucial to management of an insurance portfolio. In this sense, our choice of industry controls for Golden and Ma's proposition that intraorganizational conditions are important.

Total assets

To safeguard the interests of insurance policy holders, industry regulators and credit rating agencies closely assess the bankruptcy risks of each insurer. An adequate level of capital is a stringent requirement crucial to the solvency of an insurer who is at risk from major disasters. Therefore, the total asset size may be an entry barrier to smaller insurers. To control for this possible effect of economies of scale, we used the logarithm of total assets of a given firm as a control variable.

Statutorily dictated ratios

One important source of profitability variation among general insurers is the average profitability of the various market niches in which an insurer operates. However, unlike other industries, the basic business of insurers is to estimate and manage risks. As a result, two interrelated factors render the average profitability of the various market niches an implausible indicator for this type of profitability variation. First, different market niches require different levels of loss reserves. Second, different firms adopt different loss reserve policies, provided that these policies do not violate statutory requirements. Therefore, the gross average profit margin in a market niche is not a direct indicator for the profitability level in that market niche, not only because no such profit margin was published in the industry, but also the techniques in actuarial estimation of the profit margin are firm-specific knowledge of an insurer.

One way to assess this type of profit variation is to control for the level of 'riskiness' of an insurer, because finance scholars have routinely argued that the investigation of firm performance must account for indicators of risks. In particular, insurance firms face two types of risks due to the different market niches entered: insolvency risk and investment risk. *Insolvency risks* can deter insurers from entering market niches with the highest profit margins. For example, after the 9–11 terrorist attack, few insurers provided quotes on aircraft insurance, *regardless* of the gross profitability of aircraft insurance, and the level of competition in the aircraft insurance market. *Investment risk* arises when an insurance firm invests its premiums

in stocks and shares, whose prices are impacted by the financial markets. We used a set of indicators to assess these two types of risks. These indicators adjust for (a) the *average* risk level of the various market niches of an insurers, (b) variation in the reserve policies among insurers, and (c) the investment risk of the insurers.

We chose this set of control variables for three reasons. First, the control variables were widely watched by industry stakeholders, such as policy buyers, insurance agents, and academics, to monitor the insolvency risk, investment risk and idiosyncratic accounting policies of insurers. Second, OSFI (and its predecessor, Canadian Department of Insurance) requires insurers to report these variables. Third, 'recommended ranges' for these variables are provided either by OSFI or the major independent Canadian insurance rating agency, Trac. Usually, both OSFI and Trac publish the same 'recommended ranges,' which are then adopted widely by industry stakeholders (e.g., insurance brokers and customers) as yardsticks against which to evaluate insurers. These variables are explained in detail in the Appendix.

Number of single-market-firm rivals and Number of second-step firms

A rival is referred to as a single-point rival if this rival and the focal firm overlap in one and only one product line. We use the variable *Total number of single-market-firm rivals of a focal firm* to control for the possible competitive pressure from single-point rivals.

We create a variable, denoted by *Number of second-step firms*, to control for the effect of firms that do not share direct market contact with a focal firm. When a focal firm (Firm i) has a rival (Firm j), a third firm (Firm k) is referred to as the second-step firm of Firm i, when Firm k has market contact with Firm j, but not with Firm i. Firm k may affect Firm i's performance by attacking Firm j. Because Firm j has to divert resources to fend off k's challenge, Firm j's competitive pressure on Firm i is reduced.

RESULTS

Table 2, which displays descriptive statistics and bivariate correlations for all variables, does not show problems of multicollinearity. Variance influence factor (VIF) analyses (Neter, Wasserman, and Kutner, 1985) reveal that all of the independent and control variables have a VIF lower than 7.74, comfortably below the suggested critical limit of 10 (Chatterjee, Hadi, and Price, 2000). Table 3 reports the results of our analysis of Canadian general insurers. Model 1 is the baseline model containing all of the control variables. The coefficient of *Index of test of receivables* is negative and significant ($p < 0.001$), supporting the notion that higher levels of receivables relative to an insurer's surplus negatively impact profitability. In addition, the coefficient of *Change in surplus* is marginally significant ($p < 0.10$). This result indicates that firms with higher levels of surplus are associated with marginally higher levels of return before tax.

Model 2 adds one independent variable, *Entropy measure of diversification*. The coefficient of this variable is not significant. This result provides no support for Hypothesis 1, which predicted a positive relationship between diversification and performance. Model 3 includes all of the remaining independent variables. The coefficient of *Entropy measure of diversification* remains insignificant. The coefficient of *Average MMC per rival* is negative and significant ($p < 0.01$). This result is contradictory to Hypothesis 2a, which predicted that a given firm's confrontation with its rival across multiple marketplaces would enhance performance. That is, we find that multi-market competition per se results in lower performance. However, as predicted by Hypothesis 2b, the coefficient of *Similarity weighted MMC per rival* is positively and significantly associated with performance ($p < 0.05$). The results for these two variables (*Average MMC per rival* and *Similarity weighted MMC per rival*) indicate that multi-market contact does not inevitably lead to forbearance and higher performance, and that the impact of multi-market contact is twofold. First, multiplicity of contacts with rivals per se does not improve but actually worsens performance. Multiple battlefields may only expose the firm's vulnerabilities in certain markets and open opportunities for its rivals to exploit (McGrath, Chen, and MacMillan, 1998; Stigler, 1988). Mutual forbearance cannot be assumed from the occurrence of multi-market interactions. Second, where firms are very similar in their diversification portfolios they develop a familiarity with each other,

Table 2. Descriptive statistics and bivariate correlations

		Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Rate of return before tax	11.31	36.39															
2	Investment risk ratio	21.87	31.50	0.06														
3	Insurance risk ratio	147.19	132.23	−0.06	0.32													
4	Change in NPW	39.25	160.85	−0.03	−0.10	−0.13												
5	Change in surplus	19.77	81.15	0.01	−0.10	−0.12	0.28											
6	Index of test of receivables	1.25	9.83	−0.24	0.09	0.26	−0.03	−0.03										
7	Change in surplus	118.71	131.73	−0.01	0.40	0.72	−0.11	−0.07	0.12									
8	Numeric TRAC score	30.35	4.83	0.19	−0.04	−0.37	−0.21	−0.11	−0.32	−0.47								
9	Log total assets ($1000)	11.10	1.68	0.11	0.45	0.40	−0.15	−0.07	−0.01	0.50	0.04							
10	Firm similarity	0.26	0.25	−0.04	−0.18	−0.24	0.05	0.05	−0.03	−0.15	−0.03	−0.30						
11	No. of second-step firms	12.46	14.33	−0.03	0.02	0.04	−0.04	0.02	0.05	0.00	−0.04	−0.07	−0.05					
12	No. of single-market-firm rivals	0.61	0.76	−0.03	0.13	0.06	−0.02	0.01	0.04	0.19	−0.08	0.40	−0.04	0.04				
13	Entropy measure of diversification	1.34	0.45	0.01	0.20	0.10	−0.06	−0.01	0.08	0.19	0.01	0.47	−0.03	−0.13	0.46			
14	Average MMC per rival	12.67	8.64	0.01	0.27	0.09	−0.07	−0.05	0.00	0.25	−0.01	0.59	−0.03	−0.12	0.66	0.81		
15	Similarity weighted MMC per rival (/1000)	1344.09	939.91	−0.01	0.00	−0.13	0.01	−0.01	−0.02	0.03	0.00	0.18	0.23	−0.19	0.48	0.68	0.76	
16	Relatedness weighted diversification	0.06	0.05	−0.01	0.03	−0.02	0.00	0.01	0.04	0.01	−0.03	0.05	−0.05	−0.01	0.08	0.32	0.22	0.17

Table 3. GLS analysis of rate of return before tax of Canadian general insurers, 1993–98

	Model 1		Model 2		Model 3	
	Beta	(S.E.)	Beta	(S.E.)	Beta	(S.E.)
Intercept	−13.97	(21.47)	−15.49	(21.55)	−36.69	(23.30)
Control variables						
Investment risk ratio	6.56E−02	(5.89E−02)	6.50E−02	(5.89E−02)	7.08E−02	(5.85E−02)
Insurance risk ratio	−1.16E−02	(1.94E−02)	−1.14−02	(1.94E−02)	−1.39E−02	(1.93E−02)
Change in NPW	−6.57E−03	(6.23E−03)	−5.65E−03	(6.30E−03)	−6.93E−03	(6.40E−03)
Change in surplus	1.83E−02	(1.12E−02)†	1.71E−02	(1.12E−02)	1.32E−02	(1.12E−02)
Index of test of receivables	−1.63	(0.12)***	−1.62	(0.12)***	−1.65	(0.12)***
Loss reserves to surplus	4.47E−02	(2.33E−02)	4.41E−02	(2.33E−02)	4.43E−02	(2.31E−02)†
Numeric TRAC score	2.18E−02	(0.28)	1.61E−02	(0.28)	−0.13	(0.28)
Log total assets ($1000)	1.99	(1.99)	2.81	(2.15)	5.34	(2.30)*
Firm similarity	−0.48	(3.97)	−0.54	(3.97)	−2.07	(4.56)
No. of second-step firms	−6.21E−02	(5.71E−02)	−6.31E−02	(5.71E−02)	−5.68E−02	(5.73E−02)
No. of single-market-firm rivals	−1.87	(1.83)	−1.58	(1.86)	−0.23	(1.89)
Independent variables						
H1: Entropy measure of diversification			−5.68	(5.57)	−0.47	(7.73)
H2a: Average MMC per rival					−1.63	(0.56)**
H2b: Similarity weighted MMC per rival (/1000)					5.72E−03	(2.64E−03)*
H3: Relatedness weighted diversification					52.08	(18.42)**
σ_u	48.76		48.90		48.57	
σ_e	21.43		21.42		21.12	
ρ	0.84		0.84		0.84	
Wald χ^2	208.46***		209.82***		230.95***	
No. of observations	822		822		820	
No. of groups	209		209		209	

† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Two-tail test. Standard errors in parentheses.

which enables mutual forbearance and raises performance. Taken together, these results imply that multi-market interactions will reduce performance unless specific conditions are in place that permit a strategy of mutual forbearance.

Finally, in Model 3, the coefficient of *Relatedness weighted diversification* is positive and significant ($p < 0.01$). This result supports Hypothesis 3, which proposes that performance will improve as the numbers of firms with the same market structure increases because of the processes of market structuration.

DISCUSSION AND CONCLUSIONS

The starting point for this paper was to explore the link between performance and intra-industry diversification. However, we incorporated an important consequence of diversification—multi-market competition—into our framework. To the best of our knowledge, this study is among the few to call for the integration of these two separated bodies of literature. We included the two sets of ideas for several reasons. First, the assumption of much of the diversification literature is that the potential benefits of diversification are derived from synergies obtained from economies of scope. But this assumption ignores the possibility that diversification may be associated with superior performance because diversified firms are able to behave opportunistically in collusion with other firms, engaging in mutual forbearance to lower the rigors of the marketplace. Our results support this line of thought. We found no benefits of intra-industry diversification per se, but did find that MMC was associated with superior performance in situations where firms had reasonable intelligence of (familiarity with) each other. This intelligence we inferred from the similarity or otherwise of competitive firms.

In other words, our results suggest that previous work on diversification may have misinterpreted the reasons why such a strategy can produce superior results. Economies of scope may in some situations provide benefits; but it may also be the ability or inability of executives to properly 'read' their competitive landscape and their ability to construct a more favorable market structure through tacit or other behaviors, that determines performance. Diversification takes executives into multiple market niches and provides them with the opportunity to negotiate with, or coerce, competitors to act in ways conducive to superior performance. Scott (1993) refers to the strategic development of coordinated multi-market behaviors with rivals as 'purposive diversification.' It would be unreasonable to draw firm conclusions from a single study but our results are provocative and suggest there is a need to revisit the underlying dynamics of diversification. Why firms diversify and why diversification contributes to performance will be better understood if further studies combine both the economic reasoning of traditional diversification studies, and the more behavioral approach underlying MMC research.

It should be noted that we studied within-industry diversification. Our results are only intended to be generalized to a single-industry population but the possible applicability of our findings to a multi-industry sample warrants further study. However, when the research focus is moved to 'multi-industry firms,' such as conglomerates, the arenas span a complex set of industries and hence the investigation of the dynamic interactions of these firms requires a research lens placed at a level higher than that deployed here (Ruef, 2000). The problem of how to identify all the competitors of a given firm is not insignificant (Li and Chuang, 2001).

Because we chose a single-industry sample, caution is required when comparing our results with those of prior studies, whose samples are predominantly multi-industry (Palich *et al*., 2000). Conceptually, within-industry diversification is a *de facto* form of related diversification. As a consequence, our choice of a single-industry sample has a distinct meaning for the testing of Hypothesis 1, which proposes that among *a group of related diversifiers* the degree of related-diversification still matters in terms of firm profitability. In comparison, the wider diversification literature examines whether among *a group of firms* the degree of diversification is associated with better performance. Empirically, a single-industry sample of diversified firms is a sample with *restriction in range*, in comparison to a multi-industry sample, in that the former only includes related diversifiers. The lack of support for Hypothesis 1 may be because it is more difficult to identify a significant relationship in a sample with a restriction in range.

An additional contribution of this paper is that we added the important proviso that mutual forbearance likely depends upon the ability of firms to 'read' the market properly, noting who are their competitors and what their likely responses would be to competitive initiatives. Our results bore out this proviso. Mutual forbearance occurs where familiarity is high. In particular, the measure of multi-market contact weighted by firm similarity (*Similarity weighted MMC per rival*) is positively related to firm performance. In contrast, the simple count of multi-market contact (*MMC per rival*) is negatively associated with firm performance. These two results echo the argument that MMC can breed tacit collusion among firms, if and only if firms can decipher the messages encoded in each other's behaviors (Jayachandran *et al*., 1999). Furthermore, MMC without familiarity may only expose the firm's vulnerabilities in certain markets and open opportunities to its rivals (McGrath *et al*., 1998; Stigler, 1988), with the consequence that the firm's performance suffers.

The results thus support the thesis that executives can contribute to performance by their actions *after* selecting market niches. It is not sufficient to adopt a strategy of diversification so as to position a firm in favorable market niches and pursue economies of scope: the firm must also interact strategically with others located in the same market niches. One way of doing so would be to deliberately acquire multiple interactions with competitors in order to gain leverage over them and abate the play of market forces. This would be consistent with resource dependence theory. That is, resource dependency centers upon the political acts of organizational actors as they seek to reduce their dependency upon other organizations while increasing dependencies upon themselves. Multi-market competition could be approached as a form of resource building, when market presence is used as a resource to enhance the bargaining power of a firm in its reciprocal negotiation with competitors. Further research might explore the extent to which this motivation is accurate and, insofar as it

is, how executives obtain and use intelligence on their competitors.

The study of multi-market interactions between firms is exciting considerable interest. A central concern is to specify the circumstances that make such interactions amenable to mutual forbearance. Baum and Korn (1999) found limited evidence of deliberate forbearance, whereas Gimeno (2002) observed the performance effect of multi-market contact occurs regardless of whether multi-market interactions were a deliberate or emergent strategy. Golden and Ma (2003) highlight the importance of intra-organizational mechanisms. More broadly, however, our finding that multi-market interaction between firms can adversely affect performance *except* under conditions of high familiarity, underlines the need for further work to uncover those conditions that push multi-market contact into aggressive competition, and those that produce mutual forbearance. A more complete understanding of multi-market competitive behavior requires attention to *both* potential outcomes.

A further line of research that promises theoretical insight concerns the benefits of structuration. We have argued that structuration processes connect initially disparate markets, providing unanticipated but often advantageous benefits to incumbent firms. *As structuration occurs, the analytical configuration of market niches becomes a coherent social entity*. That is, a pattern of diversification followed by multiple but not a single actor enacts relatedness between market niches. Relatedness then provides benefits additional to those gained from synergy and/or mutual forbearance.

The benefits of market structuration within an industry are little understood. They are interesting because they differ from synergies and mutual forbearance, in several ways. First, they are collectively created and thus provide an advantage to a class of organizations, not to a single firm, even though firms might access them differentially. The potential benefits of synergy and mutual forbearance, in contrast, are available to firms acting alone and/or to small multiples of firms. Second, they are a function of social processes and thus not necessarily a witting consequence of agentic behavior (Fligstein, 1996). Admittedly, late entrants might deliberately move into an established set of related market niches in order to take advantage of established and visible structuration benefits, but in earlier stages of market niche evolution these benefits will be unknown and beyond the calibrated action of early entrants. The potential benefits of synergies and from mutual forbearance, in contrast, are more easily associated with deliberate action by executives. Third, structuration benefits are of a sociological nature. As originally conceived by industrial economists, diversification yields benefits that are economic in form, in that they derive from optimum deployment of factors of production in structurally favorable market niches. The benefits of MMC are derived from socio-psychological (and to some extent political processes), in that they depend upon the skilled interactions of executives. Structuration benefits, in contrast, are often more ambiguous and derive from the shape of the industry and, as such, are more macro in their form. One of the merits of the present paper, therefore, is that it incorporates these different disciplinary perspectives and levels of analysis to give a fuller account of why diversified firms differ in their performance.

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APPENDIX: STATUTORILY DICTATED CONTROL VARIABLES

Variable name	Formula	Interpretation	Recommended range
Investment risk ratio	(Common stocks (market value))/(Surplus) $\times 100$	Surplus is defined as total assets minus total liabilities minus OSFI required reserves. This ratio provides an indication of the degree of risk inherent in the investment strategy being followed by the company.	OSFI: less than 100% Trac: less than 100%
Insurance risk ratio	(Net premiums written in year)/(Surplus at end of year) $\times 100$	This ratio of net premiums written to surplus is a measure of a company's ability to absorb financial shocks. The higher the ratio of premiums to surplus, the greater is the potential risk borne by the firm in relation to the surplus available to absorb loss variations.	OSFI: up to 300 or 350 Trac: up to 300 or 350
Change in net premiums written	(NPW for statement year minus NPW for prior year)/(NPW for prior year) $\times 100$	Major fluctuations in the volume of net premiums written may suggest a lack of stability in a company's operations. A significant increase in net premiums written may result from a company's entry into new classes of business or into new territories. Alternatively, an increase in net premiums may indicate change in reinsurance arrangements or signal efforts on the part of the company to cover losses by means of increased cash flow.	OSFI: −33% to 33% Trac: −33% to 33%

(*continued overleaf*)

Appendix (*Continued*)

Variable name	Formula	Interpretation	Recommended range
Change in surplus	(Surplus at end of statement year minus surplus at end of prior year)/(Surplus at the beginning of the statement year) $\times 100$	Change in surplus is the increase or decrease in surplus at the end of the current year over that of the prior year expressed as a percentage of the surplus at the end of the prior year. This change is the sum of the financial conditions of the company throughout the past year. Any significant decline in surplus is cause for concern and should prompt closer examination. Very large increases in surplus (operations rarely account for increases in excess of 50%) may signal instability, change in ownership, or other developments deserving examination.	OSFI: -10% to 50% Trac: -10% to 50%
Index of test of receivables	(Excess receivables)/(surplus) $\times 100$	In the formula, excess receivables are the greater of: (a) Receivables from subsidiary and affiliated corporations in excess of 25% of surplus; (b) receivables from subsidiary and affiliated corporations in excess of 10% of total assets (net or reinsurance); (c) receivables due from agents and brokers in excess of 60% of surplus. This test measures the degree to which solvency depends on an asset (i.e., amounts receivable), which frequently cannot be realized in the event of insolvency. In addition, this test is effective in distinguishing between troubled and financially sound companies.	Trac: 0
Loss reserves to surplus	(Unpaid claim and adjustment reserves)/(surplus) $\times 100$	This ratio provides a simple test of the leveraged position of insurers. When the leverage exceeds 250%, deficiencies in the loss reserves have a severe effect on the company's surplus. Any firm that under-reserves its claims will improve its position under this test.	OSFI: up to 250% Trac: up to 250%
Numeric TRAC score	Calculated by Trac Ltd.	Trac Ltd. calculated a set of early warning tests of solvency. These tests are the result of research into the 'early warning' procedures carried out by the OSFI. Basically, this score is positively related to the number of tests within the recommended ranges that a firm has. In other words, the higher the score, the lower the risk of the firm.	Trac: the higher the score, the lower the level of insolvency risk.

The information is provided by Trac Ltd.