Competition in Multiple Geographic Markets: The Impact on Growth and Market Entry

Heather A. Haveman
Columbia University
Lynn Nonnemaker
Association of American Medical Colleges

0001-8392/00/4502-0232/$3.00.

•

We appreciate the comments of Robert David, Roger Friedland, Vrinda Kadiyali, and Mike Waldman, and the comments of seminar participants at the University of California at Davis, Northwestern University, Columbia University, the University of Chicago, the University of California at Los Angeles, Stanford University, the University of California at Santa Barbara, and University of California at Irvine. Finally, we thank Robert David for research assistance, and Jennifer Chatman, Mike Hannan, and Don Lehmann for methodological advice.

We investigate the impact of contact between organizations in multiple geographic markets, focusing on two competitive behaviors: growth in current markets and entry into new markets. Drawing on sociological and economic theories, we propose that the extent of multimarket contact determines the level of competition experienced by a focal organization and therefore influences its growth and market entry. We also propose that market structure, specifically the extent to which markets are dominated by a few large firms, influences competition and therefore influences growth and market entry. Finally, we propose that market structure accentuates multimarket competitive dynamics, as mutual forbearance is more pronounced in markets dominated by a few large firms. Analysis of growth and market entry by a mixed population of multi- and single-market firms in the California savings and loan industry generally supports our model and shows that multipoint competition affects all rivals, multi- and single-market firms alike.•

Firms often compete with each other simultaneously in multiple markets. Many airlines vie for passengers on such well-traveled routes as New York/Chicago and Los Angeles/San Francisco; even on lower-volume routes, such as Portland/Seattle or Harrisburg/Washington, passengers generally have two or more airlines from which to choose. All across the country, Sears stores can be found at opposite ends of shopping malls from J.C. Penny and Macy's; in some areas, these national chains also compete with smaller regional operators. Finally, highly diversified firms such as Philip Morris and RJR/Nabisco meet in a vast number of customer and product markets. Research in sociology and economics has begun to address the general proposition that the behavior of firms in any single market is affected by the extent to which they meet competitors in other markets (Simmel, 1950; Edwards, 1955).

Previous research on multimarket contact and competition has two limitations. First, this work has not investigated, logically or empirically, how contact among multimarket firms affects the behavior of single-market firms. Many industries contain a large number of single-market firms and a smaller number of multimarket firms; e.g., newspapers (Carroll, 1985), telephone-equipment manufacturers (Barnett, 1993), radio stations (Greve, 1996), and hotels (Ingram and Baum, 1997). Despite the prevalence of single-market firms, previous studies of multimarket contact have generally been limited to multimarket firms, including airlines (Baum and Korn, 1996; Gimeno and Woo, 1996, 1999), general-service hospitals (Boeker et al., 1997), and cellular telephone service providers (Parker and Röller, 1997). In contrast, the research reported here analyzes data on the savings and loan industry in California, which includes both multi- and single-market firms, and examines how multimarket contact among multimarket firms spills over to single-market firms.

Second, almost all recent empirical work on multimarket contact and competitive interactions has focused on prices charged (e.g., Parker and Röller, 1997; Gimeno and Woo, 1999) or on market exit (e.g., Barnett, 1993; Boeker et al., 1997). Little has been done to analyze entry into new markets (but see Baum and Korn, 1996), and nothing has been done to analyze growth in current markets. Thus, the present study, which examines growth and market entry, adds substantially to our knowledge of the variety of organizational actions affected by multimarket contact.

Like several recent studies of multimarket contact and competition (Barnett, 1993; Baum and Korn, 1996; Parker and Röller, 1997), we focus on competition across multiple geographic markets. Geography has generally been neglected by organizational sociologists. Most organizational theory is written as though organizations, their production and information-processing activities, their material and human assets, and their suppliers and customers are not situated in a physical world and not prone to physical constraint (Friedland and Palmer, 1984). Although innovations in communication and transportation technologies—the railroad, telegraph, telephone, automobile, interstate highway, airplane, fax machine, and Internet—have diminished the impact of geographic distance by reconceptualizing space as time (Friedland and Boden, 1994), geography is still an important determinant of organizational interaction. For instance, research has shown that corporate interlocks are regionalized in space (e.g., Mizruchi, 1982; Kono et al., 1998), and organizational founding rates depend strongly on geographic location (e.g., Hannan et al., 1995; Baum and Haveman, 1997). These empirical studies suggest that we have much to gain from studying interactions among firms in multiple geographic markets.

Our paper contributes to the literature on geography and organizational dynamics by reconceptualizing general models of competitive space in terms of physical rather than social location. We do *not* consider simple geographic proximity. Instead, we extend work on social space, which comprises product markets and client groups, to physical space, which comprises regional markets, by considering the social proximity of firms across physical space. The firms that meet in these regional markets include both multimarket firms that may compete against each other in other regional markets and single-market firms that share the competitive environment created by multimarket rivals.

MULTIMARKET CONTACT AND COMPETITION

Sociologists and economists have long been interested in how organizations deal with repeated contact with rivals over time and across social and physical space. Writing about social relations in general, Simmel (1950: 286–291) argued that the potential for cooperation among rivals increases when rivals interact in multiple domains, since each will gain by allowing the other to be superordinate in some domains in exchange for similar treatment in other domains. This hypothesis of reciprocal subordination and superordination suggests that because potential competition (possible harm from aggressive competitive action by rivals) is greater among rivals who meet in multiple domains than among rivals who meet in a single domain, realized competition (actual harm from competitive action by rivals) is weaker. Fear of great reciprocal harm induces opponents who meet in multiple domains to refrain from using their strongest weapons against each other.

Writing about relations between formal organizations in particular, Edwards (1955) noted that the power of large conglomerate firms derives from the scope and character of their activities in all markets, which affect their behavior and that of their competitors in particular markets. Edwards' logic is similar to Simmel's: multimarket firms will not take aggressive action against competitors in one market if they fear retaliation from those competitors in other markets. Instead, multimarket firms will forbear from aggressive competitive behavior toward firms they meet in multiple markets, their multipoint rivals. When two firms meet in several markets, each has an incentive to stake out certain markets as its sphere of influence and to refrain from competing aggressively in the spheres of influence of its multipoint rivals, as long as its own sphere is similarly respected.

Porter (1981: 473) offered two reasons why such mutual forbearance might occur if one organization can respond to a rival's threat of increased output or decreased prices in one shared market by altering its output or prices in other shared markets. First, retaliation involving simultaneous attacks in a number of markets can be much more severe than retaliation within a single market. Second, retaliation can take place in jointly contested markets in which the retaliator's potential losses are small or the aggressor's potential losses are large, thus forcing the aggressor to bear higher relative costs for its actions. Bernheim and Whinston (1990) demonstrated analytically that multimarket contact facilitates the development of live-and-let-live policies: each firm respects its multipoint competitors' turf for fear of retaliation in its own territory.

A parallel explanation of why multimarket firms will act less aggressively toward multipoint rivals than toward single-point rivals derives from social-network models of firm behavior. Joint involvement in multiple markets—joint location in physical or social space—creates a network of indirect ties between multimarket firms. These indirect ties make multipoint rivals role-equivalent in that they are involved in similar types of exchange relations but not necessarily with the exact same partners (Winship and Mandel, 1983; Winship, 1988). For example, two large consulting firms that hire business students from different sets of schools and that advise different sets of large corporations on strategic positioning issues are role-equivalent because they are tied to similar suppliers of labor and similar clients. Because multipoint rivals are involved in similar relations with similar exchange partners, they can poach on each other's territory by wooing each other's exchange partners. Accordingly, such firms are potential substitutes and so will be motivated to limit or eliminate competition between themselves (Burt, 1980, 1982). The motivation to limit competition is stronger with multipoint rivals than with single-point rivals because the potential substitution effect is stronger.

Boeker et al. (1997) offered an additional reason why mutual forbearance might occur. The more markets in which a pair of multimarket firms meet, the more information they gain about each other's past competitive behavior—which strategic actions the other has undertaken, under what circumstances, and with what success. Thus, as the number of markets in which these firms meet increases, so does the ease and precision with which they can anticipate each other's future competitive behavior, and hence, their ability to do harm or good for each other. Organizations will compete less aggressively against organizations that they meet in multiple markets and that they therefore view as formidable competitors; they will compete more aggressively against organizations that they meet in few markets and that they therefore view as weak competitors.

Limits on the development of mutual forbearance. All three explanations of why mutual forbearance derives from multimarket contact rely on a common assumption that decision making is centralized in organizations. All three logics assume that decisions made about actions in each individual market are coordinated, that decision makers take into account the effects of actions in any individual market on the firm's activities in other markets.[1] Mutual forbearance is less likely to develop from multimarket contact for firms that have decentralized decision making, such as classic holding companies or conglomerates. Even assuming centralized control and centrally determined strategies, mutual forbearance is less likely to develop from multimarket contact when firms' domains are complex and multidimensional; some firms must weigh the impact of actions in markets defined by production and distribution technologies, clientele, and geography. In such circumstances, limits on decision makers' cognitive capacities will prevent them from finding the optimal balance between aggressive competition and mutual forbearance, if such a balance exists.

Recent studies of contact between firms across multiple markets generally support the notion that joint-location ties, which derive from operating in the same locations in physical or social space, foster mutual forbearance and attenuate competition.[2] Barnett (1993) and Boeker et al. (1997) found that multimarket contact lowered market exit rates in the U.S. telephone equipment and California hospital industries, respectively. Baum and Korn (1996) found that U.S. airlines that met in many passenger-route markets were less aggressive than airlines that met in one or a few passenger-route markets; hence, the former entered and exited markets at lower rates than the latter. Two recent studies in industrial-organization economics (Evans and Kessides, 1994; Parker and Röller, 1997) showed that multimarket contact led to high prices among U.S. airlines and cellular telephone service providers, respectively. Finally, Gimeno and Woo (1999) found that when multimarket contact among U.S. airlines was high, rivalry was low; hence, yield rates (revenues per passenger mile) were high. Taken together, these studies suggest that one key assumption implicit in this theory—that organizations make centralized decisions—holds across a variety of industrial contexts.

Collectively, those studies have several strengths. All applied dynamic statistical techniques to longitudinal data to test this inherently dynamic theory. The first three studies (Barnett,

1 We thank an anonymous reviewer for pointing out this assumption.

2 Evidence from earlier industrial-organization studies, which were generally static analyses of cross-sectional data on profits, is mixed; see van Witteloostuijn and van Wegberg (1992) for a review. These studies were beset by several research-design flaws; Barnett (1993) explained their shortcomings. Because of their methodological shortcomings, the results of these studies must be taken as indeterminate evidence for or against mutual forbearance.

1993; Baum and Korn, 1996; Boeker et al., 1997) used clear and immediate indicators of mutual forbearance: firms' behavioral responses to multimarket contact. And all six studies treated multimarket contact as a joint property of the market and the firm, rather than as something that each market participant experiences uniformly. In doing so, they recognized that multimarket contact is not just another aspect of market structure, akin to concentration, but, rather, is experienced differently by firms with different product, client, or regional location profiles.

Those studies also share one limitation: they focused exclusively on the behavior of multimarket firms and ignored the effects of mutual forbearance on single-market firms. When multipoint rivals forbear from competing with each other, they may either redirect their competitive efforts toward single-point rivals (Barnett, 1993: 275) or use the slack in incentive constraints from one market to induce single-point rivals in another market to attenuate their competitive behavior (Bernheim and Whinston, 1990; Scott, 1993: 25–27). There have been no empirical studies of such spillovers from multi- to single-market firms. Since many markets comprise a mixture of multi- and single-market firms, it makes sense to extend thinking about multimarket contact to explain the behavior of single-market firms.

Impact of Multimarket Contact on Growth and Entry

An important aspect of firm behavior that is affected by multimarket contact is the scope of organizational domains: the claims organizations stake out for themselves in terms of the clients they serve, the products they offer, and the technologies they employ (Levine and White, 1961; Thompson, 1967: 25–29). Growth within existing product, technology, or regional markets and entry into new markets are fundamental ways in which organizations redefine their domains and therefore constitute fundamental structural change for corporations (Fligstein and Dauber, 1989). These actions are also directly linked to subsequent multimarket contact: growth in current markets strengthens the interdependence between firms that currently vie for the same clients and resources in multiple markets, while entry into new markets strengthens joint-location ties to current competitors and introduces firms to new competitors.

Multimarket contact and the behavior of multimarket firms. If multimarket contact leads to mutual forbearance from competition, multimarket firms will be loath to act aggressively in markets where their level of multimarket contact is high and inclined to act aggressively in markets where their level of multimarket contact is low. Growing in current markets is an aggressive act; hence, multimarket firms will be unlikely to grow in locations where their level of multimarket contact with market incumbents is high. Therefore, holding all else constant, as the level of multimarket contact for a focal firm in a focal market increases, its growth in that market will slow. Similarly, entry into new markets is an aggressive act; hence, multimarket firms will be unlikely to enter locations where their level of multimarket contact with market incumbents is high. Therefore, holding all else constant, as the level of multimarket contact increases between a potential entrant to a market and the firms already operating in that market, the focal firm's likelihood of entry into that market will decline.

Two opposing processes may also operate. First, as the extent of multimarket contact increases, multimarket firms come to possess more information about market participants' past behavior and so can more accurately predict their future behavior (Boeker et al., 1997). This reduced uncertainty about rivals' future actions may make multimarket firms prone to grow in or enter markets where their level of multimarket contact with market incumbents is high. Second, growing in or entering markets where multipoint rivals operate may allow multimarket firms to strengthen existing footholds in competitors' domains or establish new footholds; both of these actions may help multimarket firms protect themselves from attack in other markets. This expectation of strengthening or establishing mutual footholds may make multimarket firms prone to grow in or enter markets where their level of multimarket contact with incumbents is high.

If the three processes associated with multipoint contact—forbearing from aggression, seeking greater knowledge about competitors, and seeking footholds in competitors' domains—operate simultaneously, the result will be curvilinear (inverted-U-shaped) relationships between the level of multimarket contact, on the one hand, and growth and market entry by multimarket firms, on the other hand. When a focal firm is embedded only shallowly in the network of firms operating in the focal market, growing or entering to reinforce footholds in competitors' domains and to use knowledge gained from other markets will be more important than restraining growth or market entry as part of mutual forbearance from aggression. In such circumstances, multimarket firm growth and entry will increase with the level of multimarket contact. But when a focal firm is embedded deeply in the network of firms operating in the focal market, restraining growth or entry as part of mutual forbearance from aggression will be more important than growing or entering to reinforce footholds in competitors' domains and to use knowledge gained from other markets. In such circumstances, multimarket firm growth and entry will decline with the level of multimarket contact:

Hypothesis 1a (H1a): As the level of multimarket contact between a multimarket firm and other firms in a market increases, the firm's rate of growth within that market will first increase, then decrease (i.e., there will be an inverted-U-shaped relationship between the level of multimarket contact and the rate of multimarket firm growth).

Hypothesis 1b (H1b): As the level of multimarket contact between a multimarket firm and other firms in that market increases, the firm's rate of entry into that market will first increase, then decrease (i.e., there will be an inverted-U-shaped relationship between the level of multimarket contact and the rate of multimarket firm entry).

Organizations with extensive domains, operating in multiple markets, tend to be larger than organizations with very limited domains, operating in a single market. In investigating multipoint contact, therefore, we are confronted with a potential confound. Mutual forbearance may stem either from fear of reprisal by a rival that is encountered in multiple markets or from fear of reprisal by a large rival, one that just happens to operate in multiple markets. To distinguish between these two possibilities, statistical models testing for effects of multipoint contact must include controls for multipoint rivals' size.

Multimarket contact and single-market firms. Mutual forbearance among multipoint rivals has indirect, spillover effects on single-market firms. These spillover effects may be negative or positive. On the one hand, as the level of multimarket contact among the multimarket firms that operate in a particular market increases, the competitive resources of these firms may be deflected away from each other and toward single-point rivals (Barnett, 1993: 275). If it is, then spillovers from multi- to single-market firms will be negative. For example, multimarket financial-services firms, such as banks or thrifts that have branch offices in multiple regional markets, might shift their offices in one market to locations that are very close to those of a single-market rival, thus diverting "foot traffic" from this rival. To give a second example, two large U.S. airlines (American, United, or Northwest) might raise prices or decrease the frequency of service in markets where they overlap a lot and where no regional airlines (Kiwi, Frontier, or Sun County) operate and cut prices or increase service frequency in markets where they overlap with regional airlines. This pattern of fare or service adjustments would yield negative spillovers to small regional rivals, as regional carriers would be forced to match the offerings of large carriers. Hence, if mutual forbearance among multimarket rivals focuses the competitive resources of multimarket firms on their single-market rivals, then as the level of multipoint contact among multimarket firms in a market increases, single-market firms will face stronger competition and will be less likely to grow in or enter that market.

On the other hand, the noncompetitive actions invoked by mutual forbearance may not be focused narrowly enough to benefit only multipoint rivals; these actions may instead benefit all market participants (Bernheim and Whinston, 1990). If so, spillovers from multi- to single-market firms will be positive. For example, multimarket financial-services firms (thrifts or banks) might decrease their advertising expenditures, increase their interest rates or service fees, or reduce expansion plans at all their branch offices in the focal market. These actions would benefit all rivals, multi- and single-market firms alike. Similarly, large U.S. airlines might mutually forbear from competing aggressively with each other by raising prices on restricted-fare (advance-purchase excursion) tickets. This would yield positive spillovers to small regional rivals, as they could also raise prices and still remain competitive. In such circumstances, as the level of multipoint contact among multimarket firms in a market increases, competitive pressures on all firms, multi- and single-market alike, will fall, and single-market firms will be more likely to grow in or enter that market.

There has been little research to guide us in determining whether spillovers from multi- to single-market firms are positive or negative. Therefore, we propose two sets of alternate hypotheses:

Hypothesis 1c (H1c): If spillovers from mutual forbearance among multimarket firms are *positive,* then as the level of multimarket contact among market participants increases, the rate of growth within that market by single-market firms will increase.

Hypothesis 1c alt. (H1c alt.): If spillovers from mutual forbearance among multimarket firms are *negative,* then as the level of multimarket contact among market participants increases, the rate of growth within that market by single-market firms will decrease.

Hypothesis 1d (H1d): If spillovers from mutual forbearance among multimarket firms are *positive,* then as the level of multimarket contact among market participants increases, the rate of entry into that market by single-market firms will increase.

Hypothesis 1d alt. (H1d alt.): If spillovers from mutual forbearance among multimarket firms are *negative,* then as the level of multimarket contact among market participants increases, the rate of entry into that market by single-market firms will decrease.

To test these hypotheses, it is necessary to deal with a potential confound between the extent of multipoint contact between multimarket firms and the overall size of these firms. To distinguish between two possibilities—that the expansion behavior of single-market firms is affected by the sheer size of multimarket rivals or by the density of the multimarket network itself—statistical models testing for effects of multimarket contact must include controls for the overall size of multimarket firms.

Market structure and spheres of influence. When multimarket firms operate alongside one or a few dominant multipoint rivals, they are likely to respect the spheres of influence of those dominant firms and, therefore, limit expansion activities, but they will be prone to enter or grow in markets contested by many of their multipoint rivals. The proportion of a market controlled by the largest multimarket firms is a good indicator of the extent to which that market is dominated by one or a few incumbents. When a few multimarket firms control a large proportion of any market, other multimarket firms are motivated to forbear from aggressive expansion activity in that market because the potential harm to aggressors from retaliation by dominant players is greater than the potential harm from retaliation by minor players. This is true for three reasons. First, firms are most likely to retaliate in markets within their spheres of influence, where they clearly dominate. Hence, dominant players are more likely to retaliate than minor players. Second, retaliatory efforts by dominant players are likely to be harsher than retaliatory efforts by minor players, because dominant players have more market power to control prices and to lock up reliable, high-quality supplies of material, financial, and human resources. Finally, it is easier for dominant players than for smaller players to oversee the actions of rivals, simply because dominant players have more extensive knowledge of the market from their ongoing operations and are likely to have greater reserves of slack resources that can be devoted to gathering intelligence on competitors. Thus, as market dominance by the largest multimarket firms increases, signaling that market as the sphere of influence of one or a few multimarket firms, rates of growth and entry by other multimarket firms will decline:

Hypothesis 2a (H2a): As market dominance by the largest multimarket firms increases, the rate of growth within that market by multimarket firms will decrease.

Hypothesis 2b (H2b): As market dominance by the largest multimarket firms increases, the rate of entry into that market by multimarket firms will decrease.

Domain expansion by single-market firms will also be influenced by the extent to which markets lie clearly within the sphere of influence of a few multimarket firms. The motivation to retaliate against aggressors, the ability to set prices, and the ability to observe the actions of rivals all accompany market dominance by a few large players and will be hazardous to all potential aggressors, multi- and single-market firms alike. Thus, we expect negative relationships between market dominance by a few multimarket firms and rates of growth and market entry by single-market firms:

Hypothesis 2c (H2c): As market dominance by the largest multimarket firms increases, the rate of growth within that market by single-market firms will decrease.

Hypothesis 2d (H2d): As market dominance by the largest multimarket firms increases, the rate of entry into that market by single-market firms will decrease.

Market structure as a moderator. Market structure may moderate relationships between multimarket contact, on the one hand, and growth and market entry, on the other. Mutual forbearance among multimarket firms may be greatest in markets dominated by a few large multimarket players (Mester, 1987; Phillips and Mason, 1992). This prediction is congruent with Bernheim and Whinston's (1990) game-theoretic analysis: gains from mutual forbearance are greatest when a few firms dominate a market because collusion and mutual forbearance from competition is substantially easier for a few oligopolists than for many rivals. This line of reasoning implies amplifying interactions between the degree to which a market is dominated by a few large multimarket firms and the level of multipoint contact. In support of this logic, Baum and Korn (1996) found that dominance of a market by a single firm facilitated mutual forbearance in the U.S. airline industry.

Hypothesis 3a (H3a): The impact of multimarket contact on the rate of growth in current markets by multimarket firms will be amplified when those markets are dominated by a few multimarket firms.

Hypothesis 3b (H3b): The impact of multimarket contact on the rate of entry into new markets by multimarket firms will be amplified when those markets are dominated by a few multimarket firms.

Hypothesis 3c (H3c): The impact of multimarket contact on the rate of growth in current markets by single-market firms will be amplified when those markets are dominated by a few multimarket firms.

Hypothesis 3d (H3d): The impact of multimarket contact on the rate of entry into new markets by single-market firms will be amplified when those markets are dominated by a few multimarket firms.

For multimarket firms, we predicted that the main effect of multimarket contact would be curvilinear, with an inverted-U shape. An amplifying interaction with market dominance would require the estimated interaction coefficient to be positive when the main effect of multimarket contact is positive and negative when the main effect is negative, also producing an inverted-U shape. For single-market firms, we predicted that the main effect of multimarket contact would be linear: positive if spillovers between multi- and single-market firms are positive (H1c and H1d) and negative if spillovers between multi- and single-market firms are negative (H1c alt. and H1d alt.). In the first situation (H1c and H1d), amplifying interactions with market dominance would require positive interaction coefficients; in the second situation (H1c alt. and H1d alt.), amplifying interactions would require negative interaction coefficients.

METHOD

We tested our hypotheses on a population of savings and loan associations (thrifts) operating in California between 1977 and 1991. The thrift industry offers an excellent site for investigating rivalry in multiple geographic markets. Ever since the first thrift was founded in 1831, these firms have had a strong sense of regional affiliation. This is due in large part to two facts: thrifts invest in home mortgages, and knowledge about borrowers and property has traditionally been localized (Friend, 1969; Gart, 1989). That the names of these organizations frequently include a city or county supports this contention: First Federal S&L of Fresno and Century City S&LA are typical California thrift names.

We defined geographic markets at the county level. Our choice of market boundaries is consistent with that used by other scholars in studies of multimarket contact among savings and loan associations (Mester, 1987) and commercial banks (Heggestad and Rhoades, 1976, 1978), although we recognize that any definition of market boundaries is problematic. As a unit of analysis, the county is sometimes too large (in Santa Barbara county, thrifts in the city of Santa Barbara do not compete very much with thrifts in Santa Maria), sometimes too small (in San Francisco county, thrifts in the city of San Francisco compete to some extent with thrifts in Oakland and San Rafael, which are in Alameda and Marin counties, respectively), and sometimes just right (in Ventura county, thrifts in the cities of Ventura and Oxnard compete with each other but do not compete much with thrifts in Los Angeles county to the southeast or Santa Barbara county to the northwest). Both obvious alternatives to the county as unit of analysis are worse: the city is often too small and sometimes just right, while the consolidated metropolitan statistical area (a set of counties that are identified by the

Census Bureau as economically interdependent) is often too large and sometimes just right.

In the period covered by our study, the geographic range of operations of most thrifts was limited: the typical California thrift had branch offices in four counties. The largest thrift had branches in 36 of the 58 counties in the state, while 224 firms (out of 321) had branches in just one county over some part of the observation period. Thus, our research population provides a good mix of single- and multimarket firms.

Variables

Our data come from annual volumes of the *Directory of Members* of the Federal Home Loan Bank of San Francisco (FHLB, now the Office of Thrift Supervision), which record all savings and loan associations operating in California and list all branch office addresses. We acquired directories from 1977 to 1991. In addition to the location of thrifts' branch offices, these directories provide simple balance sheets, which enabled us to determine the size of thrifts' asset bases. The directories also record changes in firm names, mergers, and dissolutions, so we could construct reliable organizational histories. We obtained confirmation of the nature and timing of these events from the Public Information Office of the FHLB of San Francisco and from perusal of a merger and liquidation file compiled by the FHLB Board of Washington, DC. The data take the form of one observation per firm per county market per year (139,606 records, 58 records per firm per year), and our unit of analysis is the firm in a particular county market in a particular year. We coded the location of each firm's branch offices each year and counted the number of branch offices for each firm in each county market.

Dependent variables. To measure market entry, we created an indicator variable *(enter)* equal to one if a firm entered a market between a focal year and the next one and zero otherwise; thus, *enter* equaled zero if the firm did not operate in the market in question in either a focal year or the next one, or if the firm operated in the market in both years. Market entry can be a repeated event, since a firm can enter a market, exit from the market, and later reenter the market. Market entry processes are confounded with founding processes: new entrants to a market can be newly founded organizations entering through birth or established organizations entering through expansion. We studied only entries that occurred through the expansion of established firms and ignored entries that occurred through the birth of new firms because the micro processes of our model pertain to established firms that change their domains in response to multipoint contact.

Our analyses of market entry by multimarket firms include up to 56 counties for each firm each year and exclude the two or more counties in which multimarket firms already operated. Our analyses of market entry by single-market firms include 57 counties for each firm each year and exclude the single county in which single-market firms already operated.

We wanted to analyze growth in current markets in a way that paralleled our analysis of entry into new markets. Accordingly, we created an indicator variable *(grow)* equal to one if a firm's branch-office network expanded between a focal year and the next one and zero otherwise; thus, *grow* equaled zero if the focal firm's branch-office network remained the same size or shrank. Like market entry, growth can be a repeated event. Our choice of a binary indicator for growth does not permit our analysis to be as fine-grained as would the choice of modeling either the number of branch offices opened in a county or proportionate growth in firms' county-level branch-office networks. But the advantages of our choice—the ability to compare directly results on growth within a current market to results on entry into new markets and the ability to focus on growth events and ignore contraction events—outweigh this disadvantage.

Our analyses of growth include only those organizations that were in the focal market at both the beginning and the end of a year and do not include market entry or exit or newly founded or failing organizations, just established and surviving ones. Our analyses of growth by multimarket firms include one observation per year per county in which the focal firm had branch offices and exclude the counties in which multimarket firms did not already operate. The maximum number of observations on a multimarket firm in a single year is 36. Our analyses of growth by single-market firms include only a single county for each firm each year and exclude the 57 counties in which single-market firms did not already operate.

Independent variables. The theory developed above proposes first that the extent of multimarket contact with market incumbents influences multimarket firms' propensities to expand in and enter geographic markets (H1a and H1b). For each multimarket firm i and each county market in California m, we calculated MPC_{imt}, the aggregate intensity of multipoint contact between firm i and those multipoint rivals j that operate in market m at time t:

$$MPC_{imt} = \sum_{j \neq i} \left[MPR_{ijt} \times D_{jmt} \times \frac{\sum_{n=1}^{58} (D_{int} \times D_{jnt})}{\sum_{n=1}^{58} D_{int}} \right],$$

where MPR_{ijt} is an indicator variable set equal to one if firm j is a multipoint rival of firm i at time t and zero otherwise, and D_{imt} is an indicator variable set equal to one if firm i has branch offices in market m at time t and zero otherwise. Because this measure is complex, we discuss its components. We start by counting the markets where firm i meets other firms j at time t ($\Sigma_n D_{int} \times D_{jnt}$) and then scale this count by the number of markets in which firm i operates at time t ($\Sigma_n D_{int}$) to calculate a proportion (range zero to one). Because there are 58 county markets in California, we sum contact points between pairs of rivals from 1 to 58. The next step in the construction of this measure is to condition this proportion on two facts: (1) firm j operates in market m at time t

(D_{imt} = 1), and (2) firm j is a multipoint rival of firm i at time t (MPR_{ijt} = 1). The final step is to sum this conditional proportion across all firms j. The resulting variable ranges from zero, when firm i does not meet any multipoint rivals in market m, to industry density minus one, when all other firms j in the industry are multipoint rivals of firm i, operate in market m, *and* operate in all other markets n. Only multimarket firms have non-zero values for MPC_{imt}; for single-market firms, MPC_{imt} always equals zero, since single-market firms have no multipoint rivals.

Our measure differs slightly from those used by others who have most recently studied multimarket contact and mutual forbearance (Baum and Korn, 1996; Gimeno and Woo, 1996, 1999). It does not scale multipoint contact by the number of multipoint rivals that firm i meets in market m at time t. Therefore, MPC_{imt} measures total, not average, multipoint contact experienced by firm i in market m at time t across all multipoint rivals. We tested for curvilinear effects on rates of growth and market entry by including in our statistical models linear and quadratic terms for MPC_{imt}.

Our theory further proposes that growth and market entry by single-market firms will be influenced by the level of multipoint contact among market incumbents (H1c, H1c alt., H1d, and H1d alt.). To test these hypotheses, we summed the intensity of multipoint contact among incumbents in a focal market:

$$MPC_{mt} = \sum_i MPC_{imt}.$$

H2a–H2d concern the main effect of market dominance by a few multimarket firms. Because our theory focuses on the distribution of market share among the largest multimarket players, we measured *market dominance* as the total market share of the four multimarket firms with the largest branch-office networks in the focal market at the start of the focal year. We counted the number of branch offices operated by the four largest firms and divided by the total number of branch offices operated by all firms. When there were ties between firms ranked fourth and fifth, we included only one of the tied firms in our calculation of *market dominance;* hence, we always summed market share for exactly four firms. This measure is more appropriate for testing our theory, which focuses on the largest firms in a market, than is the Hirschman-Herfindahl or Gini index of concentration, both of which incorporate information on the distribution of market share across all players, large and small.

We tested H3a–H3d, which concern the strengthening influence of market dominance by one or a few multimarket firms on mutual forbearance, with interaction terms. For our analysis of multimarket firms, we multiplied the linear and quadratic terms for multipoint contact (MPC_{imt}) by market dominance. For our analysis of single-market firms, we multiplied aggregate multipoint contact (MPC_{mt}) by market dominance.

Control variables. Our analyses controlled for two features of the focal firm: overall size and geographic distribution of branch offices. Size can be used as a weapon to lower barriers to market entry and growth (Caves and Porter, 1977; Haveman, 1993). We measured *focal-firm size* in terms of assets across all markets, measured in constant 1977 dollars and logged to normalize the distribution.

Because the current competitive stance of the focal firm is likely to influence later competitive moves, we measured the *geographic diversification* of each firm's branch-office network using Blau's (1977) index of heterogeneity:

$$\text{Geographic Diversification}_{it} = 1 - \sum_{m=1}^{58} \left(\frac{NBr_{imt}}{NBr_{it}} \right)^2,$$

where NBr_{imt} is the number of branch offices firm i has in market m at time t. This index is an application of the Hirschman-Herfindahl index to the distribution of a thrift's offices among geographic markets (Berry, 1974: 62–63). The Hirschman-Herfindahl index is subtracted from one to produce an index that increases with geographic diversification. If all of a thrift's branch offices are concentrated in one county market, this measure of geographic diversification equals zero; if a thrift's branch offices are spread evenly across all 58 county markets, it equals 1 – 1/58, or .983. For all single-market firms, geographic diversification always equals zero. Therefore, we included this variable only in analyses of multimarket firms.

We also considered the possibility that firms might exhibit strategic momentum. In analyses not reported here, we controlled for previous-period moves. In models of growth in current markets, we controlled for the number of growth events in the firm's overall branch-office network in the previous year; in models of market entry, we controlled for the number of entry events in the previous year. Both of these variables had nonsignificant effects on growth and entry, so we excluded them from the analyses reported below.

We controlled for the size of those rivals that operate in each county market (*multipoint rivals' size*) to distinguish the effects of sheer size from the effects of extensive multipoint contact. For multimarket firms, we summed the overall size (across all 58 counties) of those multipoint rivals that the focal firm met in the focal market:

$$\text{Multipoint Rivals' Size}_{mt} = \sum_{j \neq i} \left(MPR_{ijt} \times D_{jmt} \times \sum_{n=1}^{58} NBR_{jnt} \right),$$

where MPR_{ijt} is an indicator variable set equal to one if firm j is a multipoint rival of firm i at time t and zero otherwise, D_{jmt} is an indicator variable set equal to one if firm j has branch offices in market m at time t and zero otherwise, and NBr_{jnt} is the number of branch offices firm j has in market n at time t. For single-market firms, we calculated *multimarket rivals' size* by summing the overall size (across all 58 counties) of all multimarket firms operating in the focal market:

$$\text{Multimarket Rivals' Size}_{mt} = \sum_{j \neq i} \left(\text{DMMF}_{jt} \times \text{D}_{jmt} \times \sum_{n=1}^{58} \text{NBR}_{jnt} \right),$$

where $DMMF_{jt}$ is an indicator variable set equal to one if firm j is a multimarket firm at time t, operating in two or more county markets at time t.

We controlled for the size (i.e., maturity) and attractiveness of each county market with an index *(market size)* derived from a principle-components factor analysis of eight time-varying county-level features. The eight features included in this index are human population in the county at the start of the calendar year, aggregate income in the county for that calendar year (in constant dollars), the number of new homes built in the county during the year, the value of homes built in the county during the year (in constant dollars), the number (density) of commercial banks operating in the county at the start of the calendar year, total employment in those banks, the number (density) of savings and loans at the start of the calendar year, and total employment in those savings and loans. We combined these into a single index because they were highly correlated (average correlation ≈ .8), and we wanted to reduce problems associated with multicollinearity in our nonlinear statistical models. We standardized the variables by dividing all observations on a variable in a calendar year by that variable's standard deviation for that year. A reliability test on these eight variables, conducted using the SAS procedure CORR (SAS, 1990a), showed an extremely high Cronbach's alpha (.978). The eigenvalue for the single factor extracted by the SAS procedure FACTOR (SAS, 1990b) was 6.95. The eigenvalue for the second factor was .846; hence, we are confident that there was only one common factor.

Note that *market size* incorporates thrift density, the standard measure of competition within the focal population, as well as the density of thrifts' closest competitors, commercial banks. This variable was highly correlated with the aggregate multipoint contact variable (MPC_{mt}) used in our analysis of single-market firms (r = .83) and moderately correlated with the firm-specific multipoint contact variable (MPC_{imt}) used in our analyses of multimarket firms (r = .47). Correlations of this magnitude are not surprising, since the list of counties with the highest scores on *market size* (Los Angeles, San Diego, Orange, Santa Clara, and San Francisco) was similar to the list of counties with the highest scores on MPC_{mt} and MPC_{imt} (Los Angeles, Orange, Riverside, Santa Clara, and San Diego).

Finally, we controlled for three characteristics of the broad economic system within which thrifts operate that are likely to exert distinct, time-varying influences on rates of market entry and growth: the gap between long- and short-term interest rates (*interest rate gap*), the regulatory climate (*regulatory period*), and the gross state product *(GSP)*. The first variable measures interest-rate risk and controls for the problems inherent in managing a portfolio of long-term mortgage loans and short-term deposit accounts; the second variable is a period dummy set equal to zero for the years 1977–1981 and to one for the years 1982 onward to reflect passage of the Garn-St. Germain Act in March of 1982; and the third variable measures the general health of the state economy.

Model Specification and Estimation

We tracked the expansion of California savings and loan associations' branch-office networks within the state.[3] Our measures of market entry and growth are discrete and time-varying variables, and our explanatory variables are a mix of continuous and discrete variables. Accordingly, we estimated event-history models (Tuma and Hannan, 1984: 243–264) in which the dependent variable is the instantaneous rate of market entry (or growth), defined as

$$r_{imt} = \lim_{dt \downarrow 0} \frac{\Pr[t \leq T < t + dt, \text{ expand in market } m | T \geq t]}{dt},$$

where r_{imt} is the instantaneous hazard rate of entry into market m (or growth in market m) for firm i at time t and Pr[.] is the probability of entry (or growth) between times t and t+dt, given that the firm is at risk of entering (or growing in) market m at time t. The set of markets that a firm was at risk of entering was the set of markets in which that firm did not have branch offices, while the set of markets that a firm was at risk of growing in was the set of markets in which that firm did have branch offices.

We considered limiting the risk set for market entry to those county markets that are adjacent to the county markets in which a firm already operated. But well over half of the market entries we observed occurred outside these adjacent counties. Accordingly, we defined the risk set for entry as any county in the state in which the focal firm did not have branch offices.

Using the SAS procedure GENMOD (SAS, 1996; see Allison, 1995), we estimated models of the following general form:

$$r_{imt} = \exp[\beta' x_{imt}],$$

where x_{imt} is a vector of time-varying explanatory and control variables. This log-linear form constrains the rate of growth or market entry to be non-negative. We used the logit link function because we had no clear a priori expectations of time dependence for either type of expansion activity.

The GENMOD procedure controls for right censoring. Right censoring occurs when the value of the outcome under study is unknown because the event of interest has not yet occurred for some actors in the sample. The GENMOD procedure allows right-censored observations to be used in estimating parameters, thereby avoiding biases that result from eliminating censored observations or from treating censored observations as though events occurred when the period ended (Sørensen, 1977; Tuma and Hannan, 1984: 122–128).

Any firm in our sample can enter two or more markets at one time, and any multimarket firm in our sample can grow in two or more markets at one time. The theoretical maximum

3
In 1980, federally chartered thrifts were permitted to open branch offices in other states. By 1991, eight California thrifts had branched out into other states. We do not examine interstate expansion here because this is a relatively rare event and because we do not have data on the composition of geographic markets in other states.

number of observations on a firm's activities is bounded only by the number of counties in the state. This poses an estimation problem. The unit of analysis in event-history models is generally the social actor under study; for most studies of discrete organizational change events, like growth and entry, the unit of analysis is the organization. But in our study, the unit of analysis is the organization in the market each year, and we pooled data on organizations' entry and growth behavior across multiple markets and multiple years. Our analysis of market entry and growth may therefore be subject to two kinds of nonindependence bias: one from pooling multiple observations on each firm at each point in time, the other from pooling multiple observations on each market at each point in time. Both lead to cross-sectional autocorrelation, which occurs when higher-order, more general factors that characterize a particular firm (or a particular market) influence the behavior of that firm in all markets (or all firms in that market) at one point in time (Greene, 1990: 469–472).[4]

To correct for the problem of repeated observations on each multimarket firm, we used the generalized estimating equations that are available in the GENMOD procedure (SAS, 1996), which allowed us to specify the distribution of our dependent variable while making adjustments for possible nonindependence of errors (see Liang and Zeger, 1986). We specified the error structure to be correlated for all observations on a firm within a year. In particular, we specified the correlation matrix for the error terms to be exchangeable—correlated across all markets, with no difference in the correlation between any pair of markets. Positive correlations of errors for a given organization across markets indicates a tendency on the part of the focal firm to expand or contract overall. In contrast, negative correlations of errors for a given organization across markets indicates that expansion in one set of markets is accompanied by contraction in another set of markets, perhaps because the focal organization is constrained by its budget or is shifting the mass of its retail activity from one geographic region to another.

We also sought to limit the problem of repeated observations on each firm and each market by including firm-level controls (focal-firm size and geographic diversification) and market-level controls (size of rivals and market size). By doing so, we included the most important sources of nonindependence that stem from the features of each firm and each market.

The data were broken down into spells, one spell per firm per market per year, to allow independent and control variables to be updated annually. We estimated results separately on four distinct subsamples: (1) multimarket firm growth, (2) multimarket firm entry, (3) single-market firm growth, and (4) single-market firm entry. In all subsamples, independent and control variables were measured at the beginning of each year; the dependent variables, growth and market entry, were measured between the beginning and end of each year.

RESULTS

Figures 1 through 3 show trends in the industry over the decade covered by this analysis. Figures 1a and 1b reveal the prevalence of multi- and single-market firms. Figure 1a

4
Cross-sectional autocorrelation is often termed spatial autocorrelation, because it has been studied mostly in the context of nonindependence of events in different geographic regions. Cliff and Ord (1973) and Narroll (1970) provided introductions to spatial autocorrelation in economic geography and cultural anthropology. Doreian (1980, 1981) and Dow (1984) discussed spatial autocorrelation in sociology.

Figure 1a. Total number of multi- and single-market savings and loan associations in California.

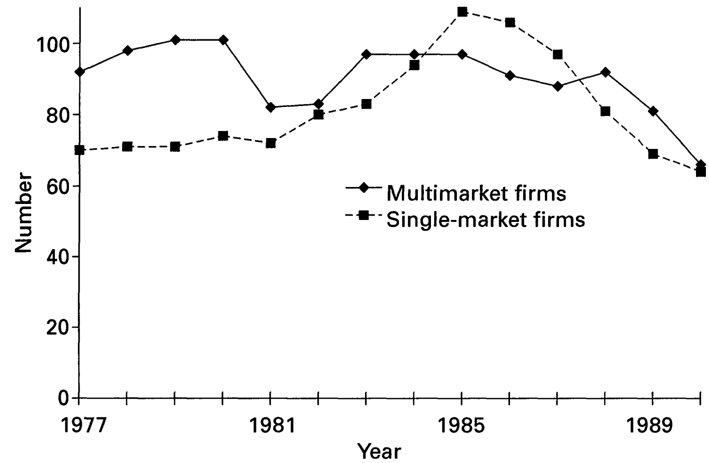
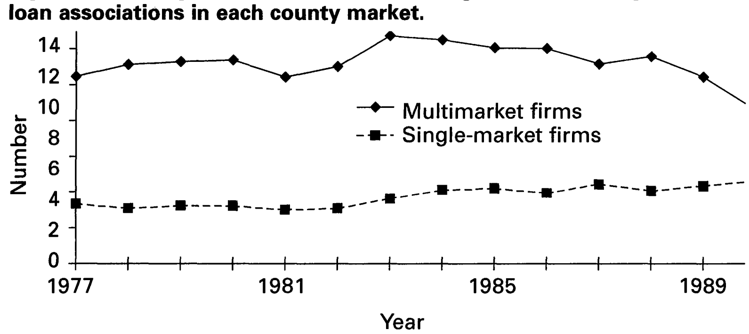


Figure 1b. Average number of multi- and single-market savings and loan associations in each county market.



shows that about half of the firms in this industry were multimarket firms and that single-market firms became relatively more numerous over the course of our observation period; however, figure 1b shows that throughout our observation period, multimarket firms dominated the typical geographic market numerically. Our research population, therefore, provides an interesting mix of multi- and single-market firms. This is an important difference from previous empirical studies, which have analyzed multimarket firms only.

Figures 2 and 3 demonstrate that there was a lot of action—much growth in existing markets and many entries into new markets—over the 15 years we studied. Figure 2 shows that

Figure 2. Number of growth events by multi- and single-market firms.

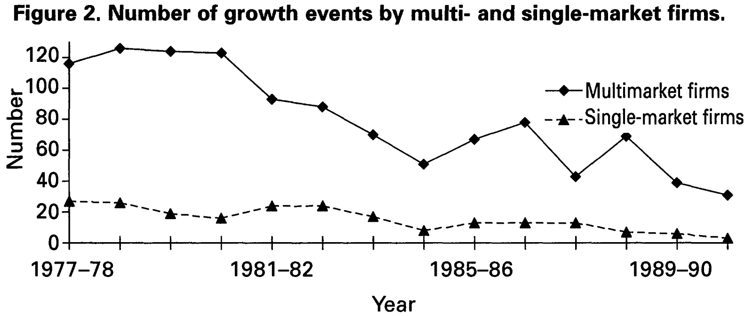
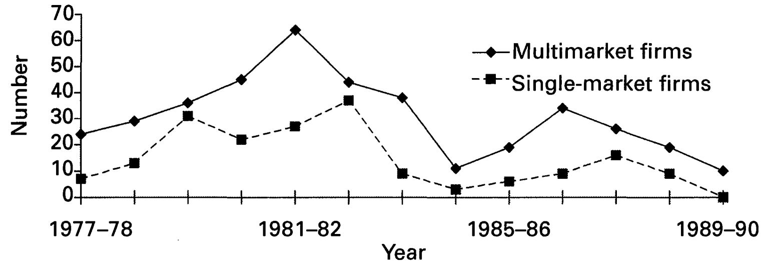


Figure 3. Number of entry events by multi- and single-market firms.



expansion in existing markets was done mostly by multimarket firms: there were 1,118 growth events by multimarket firms, and 216 growth events by single-market firms. Similarly, figure 3 shows that multimarket firms proved more likely to expand into new markets than single-market firms: over our observation period, there were a total of 605 market-entry events, 411 by multimarket firms and 194 by single-market firms.

Tables 1–4 present descriptive statistics—means, standard deviations, minima, maxima, and correlations—for the variables in our analyses. Each table presents descriptive statistics for one subsample: multimarket firm growth, multimarket firm entry, single-market firm growth, and single-market firm entry.

Growth by multimarket firms. Table 5 presents hazard-rate estimates of growth by multimarket firms within their current geographic domains. Model 1 presents the baseline model. It shows that large firms were more likely to expand within their current regional markets. It also shows that thrifts were less likely to expand in markets where large multipoint rivals operated, and more likely to expand in large markets—those with high human populations, high aggregate income, many valuable new homes built in the previous year, many thrifts and banks, and large thrifts and banks. Finally, the model shows that thrifts were less likely to expand in their current markets when the state economy (proxied by GSP) was doing well.

Model 2 adds the extent of multipoint contact and shows a positive but nonsignificant effect. Model 3 shows an inverted-U-shaped effect for multipoint contact, which supports hypothesis 1a. The peak of this curve, which occurs at a value of 28.5 for MPC_{imt}, lies within the observed range for multipoint contact (0 to 52). At the average value for MPC_{imt}, the multiplier of the growth rate is 3.18, which indicates that the typical level of multipoint contact trebled multimarket firms' growth rates over what they would have been if only single-market rivals operated.

Model 4, which contains only a linear term for multipoint contact, shows a negative and statistically significant effect for market dominance on growth, consistent with hypothesis 2a. Model 5 adds the quadratic term for multipoint contact, and the coefficient on market dominance becomes nonsignificant. This decrease in significance level between models 4 and 5 may have occurred because of multicollinearity: market dominance is correlated at –.6 and –.4 with the linear and

Table 1

Descriptive Statistics and Correlations for Growth in Existing Markets by Multimarket Firms*

	1	2	3	4	5	6	7	8	9	10	11	12	13
Mean	.128	12.9	2.90	.403	3.84	.728	3.06	.762	.861	2.17	3.50	.581	5.10
Standard deviation	.334	11.0	5.06	.222	2.47	1.06	1.77	.163	1.80	.639	1.19	.493	.851
Minimum	.000	.000	.000	.000	.000	.000	–2.65	.133	–.471	.069	1.08	.000	4.11
Maximum	1.00	52.0	27.0	1.00	13.4	5.93	5.99	.945	6.60	2.97	5.19	1.00	6.90
1. Grow		.111•	.080•	–.116•	.077•	.071•	.010	–.059•	.186•	–.054•	–.068•	–.140•	–.127•
2. MPC			.940•	–.564•	.847•	.932•	–.336•	–.615•	.669•	.038•	–.011	–.016	–.033•
3. $MPC^2/100$				–.391•	.741•	.951•	–.341•	–.606•	.615•	–.280•	–.037•	–.052•	–.062•
4. Market dominance (MD)					–.350•	–.361•	.046•	.224•	–.408•	–.152•	.036•	.063•	.053•
5. MD × MPC						.874•	–.311•	–.582•	.565•	.100•	.063•	.111•	.071•
6. MD × $MPC^2/100$							–.353•	–.626•	.642•	.014	.006	.020	–.004
7. Focal firm size								.640•	–.136•	.684•	.058•	.155•	.161•
8. Geographic diversification									–.337•	.443•	.053•	.063•	.052•
9. Market size										.067•	–.104•	–.019	–.019
10. Multipoint rivals' size/1000											.312•	.421•	.321•
11. Interest rate gap												.425•	.101•
12. Regulatory period													.824•
13. GSP/1000													

• $p < .05$.

* These statistics are calculated on pooled, cross-sectional time-series data covering 8,736 firm-market-year observations on multimarket firms making 1,118 market-growth moves between 1977–78 and 1990–91.

Table 2

Descriptive Statistics and Correlations for Entry into New Markets by Multimarket Firms*

	1	2	3	4	5	6	7	8	9	10	11	12	13
Mean	.006	4.10	.391	.622	1.80	–.100	1.56	.597	–.118	1.82	3.44	.557	5.06
Standard deviation	.079	4.73	.820	.325	1.72	.243	1.63	.188	.765	.672	1.20	.497	.854
Minimum	.000	.000	.000	.000	.000	.000	–2.65	.133	–.472	.069	1.08	.000	4.11
Maximum	1.00	30.0	9.00	1.00	13.0	3.31	5.99	.945	6.60	2.97	5.19	1.00	6.90
1. Enter		.074•	.066•	–.051•	.053•	.057•	.041•	.027•	.056•	.013•	–.003	–.024•	–.022•
2. MPC			.926•	–.492•	.863•	.892•	–.042•	–.138•	.509•	.190•	.068•	.086•	.063•
3. MPC²/100				–.375•	.754•	.941•	–.050•	–.146•	.472•	.159•	.052•	.072•	.051•
4. Market dominance (MD)					–.240•	–.305•	.073•	.055•	–.351•	.054•	.027•	.026•	.015•
5. MD × MPC						.869•	–.006	–.120•	.352•	.255•	.103•	.127•	.090•
6. MD × MPC²/100							–.038•	–.143•	.416•	.189•	.071•	.098•	.070•
7. Focal firm size								.520•	–.095•	.566•	.015•	.080•	.089•
8. Geographic diversification									–.042•	.313•	.043•	.066•	.062•
9. Market size										–.106•	–.011•	.016•	.057•
10. Multipoint rivals' size/1000											.275•	.397•	.328•
11. Interest rate gap												.450•	.136•
12. Regulatory period													.833•
13. GSP/1000													

• $p < .05$.

* These statistics are calculated on pooled, cross-sectional time-series data covering 64,692 firm-market-year observations on multimarket firms making 411 market entries between 1977–78 and 1990–91.

Table 3

Descriptive Statistics and Correlations for Growth in Existing Markets by Single-market Firms*

	1	2	3	4	5	6	7	8	9	10	11	12
Mean	.189	1.51	2.70	.312	.410	.683	−.493	2.78	2.81	3.58	.616	5.15
Standard deviation	.392	.650	1.87	.143	.140	.399	1.26	2.77	.327	1.16	.487	.840
Minimum	.000	.111	.013	.000	.000	.000	−3.82	−.440	2.01	1.08	.000	4.11
Maximum	1.00	2.49	6.18	1.00	.769	1.29	4.45	6.60	3.10	5.19	1.00	6.90
1. Grow		.013	.010	−.077•	−.066	−.039	.032	−.001	−.187•	−.055	−.244•	−.238•
2. MPC/1000			.979•	−.646•	.700•	.937•	.219•	.806•	.196•	.035	.167•	.093•
3. MPC²/1000000				−.593•	.634•	.926•	.186•	.817•	.172•	.014	.132•	.051
4. Market dominance (MD)					−.102•	−.434•	−.108•	−.454•	−.015	−.031	−.011	−.023
5. MD × MPC						.861•	.236•	.599•	.333•	.123•	.320•	.213•
6. MD × MPC²/100							.218•	.821•	.288•	.089•	.259•	.148•
7. Focal firm size								.191•	.098•	.073•	.307•	.318•
8. Market size									.103•	.032	.130•	.133•
9. Multimarket firms' size/1000										.511•	.701•	.494•
10. Interest rate gap											.423•	.096•
11. Regulatory period												.823•
12. GSP/1000												

• $p < .05$.

* These statistics are calculated on pooled, cross-sectional time-series data covering 1,141 firm-market-year observations on single-market firms making 216 market-growth moves between 1977–78 and 1990–91.

Table 4

Descriptive Statistics and Correlations for Entry into New Markets by Single-market Firms*

	1	2	3	4	5	6	7	8	9	10	11	12
Mean	.003	.496	.507	.601	.200	.165	–.493	–.052	2.81	3.58	.616	5.15
Standard deviation	.054	.511	.900	.320	.156	.237	1.26	.863	.326	1.16	.486	.840
Minimum	.000	.000	.000	.000	.000	.000	–3.82	–.472	2.01	1.08	.000	4.11
Maximum	1.00	2.49	6.18	1.00	.769	1.29	4.45	6.60	3.10	5.19	1.00	6.90
1. Enter		.076•	.081•	–.042•	.052•	.071•	.034•	.069•	–.011•	–.012•	–.036•	–.028•
2. MPC/1000			.931•	–.601•	.832•	.939•	–.0001	.765•	.088•	.038•	.057•	.018•
3. MPC^2/1000000				–.484•	.672•	.918•	–.009•	.847•	.063•	.015•	.035•	–.001
4. Market dominance (MD)					–.367•	–.464•	.017•	–.373•	–.012•	.026•	.027•	.016•
5. MD × MPC						.867•	.018•	.581•	.151•	.086•	.125•	.060•
6. MD × MPC^2/100							.007	.807•	.125•	.052•	.096•	.041•
7. Focal firm size								–.015•	.098•	.073•	.307•	.318•
8. Market size									–.012•	–.007	–.019•	–.016•
9. Multimarket firms' size/1000										.511•	.701•	.494•
10. Interest rate gap											.423•	.096•
11. Regulatory period												.823•
12. GSP/1000												

• $p < .05$.

* These statistics are calculated on pooled, cross-sectional time-series data covering 65,037 firm-market-year observations on single-market firms making 194 market entries between 1977–78 and 1990–91.

Table 5

Hazard-Rate Estimates of Growth in Current Markets by Multimarket Firms*

Variable	1	2	3	4	5	6	7
Constant	.283	−.342	−.537	.424	−.356	.383	−.272
	(.630)	(.690)	(.673)	(.695)	(.690)	(.685)	(.689)
Focal firm size	.295•••	.334•••	.368•••	.325•••	.364•••	.350•••	.352•••
	(.047)	(.050)	(.050)	(.050)	(.050)	(.050)	(.050)
Geographic diversification	−.587	.077	−.167	−.139	−.191	.146	−.091
	(.327)	(.418)	(.387)	(.410)	(.388)	(.411)	(.400)
Market size	.258•••	.225•••	.201•••	.219•••	.201•••	.209•••	.225•••
	(.016)	(.019)	(.019)	(.019)	(.019)	(.020)	(.021)
Multipoint rivals' size	−.541•••	−.732•••	−.897•••	−.738•••	−.891•••	−.874•••	−.900•••
	(.104)	(.125)	(.139)	(.129)	(.140)	(.137)	(.147)
Interest rate gap	−.022	−.002	−.009	−.003	−.009	.001	−.007
	(.043)	(.044)	(.045)	(.045)	(.045)	(.044)	(.045)
Regulatory period	−.206	−.169	−.170	−.121	−.159	−.165	−.144
	(.224)	(.230)	(.236)	(.233)	(.236)	(.232)	(.236)
GSP/1000	−.322•	−.296•	−.317•	−.304•	−.317•	−.303•	−.318•
	(.126)	(.128)	(.129)	(.129)	(.129)	(.127)	(.128)
Multipoint contact (MPC)		.017••	.116•••	.006	.108•••	−.016•	.051•
		(.006)	(.012)	(.006)	(.015)	(.008)	(.022)
$MPC^2/100$			−.203•••		−.192•••		−.015
			(.023)		(.025)		(.050)
Market dominance (MD)				−1.05•••	−.240	−1.54•••	−.850•
				(.188)	(.240)	(.283)	(.345)
MD × MPC						.135•••	.239•••
						(.030)	(.060)
MD × $MPC^2/100$							−.802•••
							(.206)
Scale parameter	1.05	1.06	1.06	1.05	1.05	1.06	1.06
Log-likelihood	−3094.3	−3091.5	−3046.6	−3077.6	−3046.2	−3067.1	−3038.0
Degrees of freedom	9	10	11	11	12	12	14

• $p < 05$; •• $p < .01$; ••• $p < .001$, two-tailed *t*-tests.

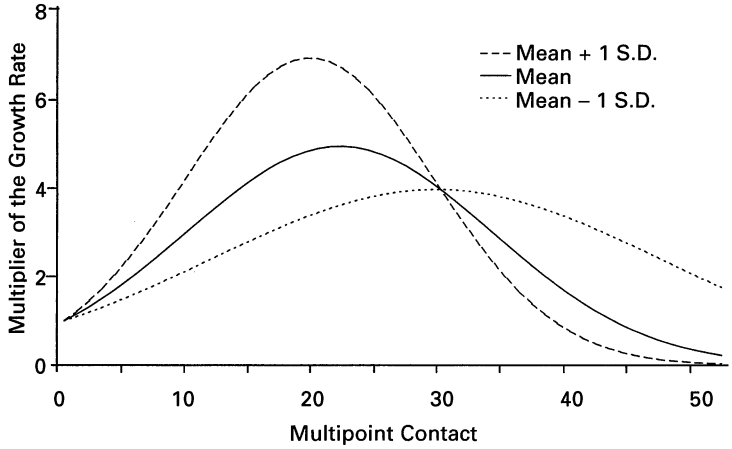
* These analyses were conducted on pooled, cross-sectional time-series data covering 8,736 firm-market-year observations on multimarket firms, which experienced 1,118 growth events between 1977–78 and 1990–91. Standard errors are in parentheses.

quadratic terms for multipoint contact, respectively. Therefore, we interpret the pattern of results shown in models 4 and 5 as supporting hypothesis 2a.

Model 6 adds an interaction between market dominance and number of multipoint rivals and shows a positive effect on growth. Finally, model 7 shows a statistically significant curvilinear interaction between market dominance and number of multipoint rivals: the estimate on the linear interaction term remains positive, while the estimate on the quadratic interaction term is negative. This inverted-U-shaped interaction amplifies the inverted-U-shaped main effect of multipoint contact.

To clarify this complex interaction, we graphed the effect of MPC_{imt} on multimarket firms' rates of growth within their current markets over the observed range of MPC_{imt} and calculated multipliers at three levels of market dominance: the mean, the mean plus one standard deviation, and the mean minus one standard deviation. Figure 4 shows these plots and demonstrates that as a market becomes ever more dominated by a few large firms, the impact of multipoint contact is amplified. When market dominance equals .181 ($\mu - \sigma$), the maximum multiplier is 3.99; when market dominance equals .403 (μ), the maximum multiplier is 4.95; and when market

Figure 4. Multiplier of the growth rate for multimarket firms (effect of multipoint contact evaluated at three values of market dominance).



dominance equals .625 ($\mu + \sigma$), the maximum multiplier increases to 6.94. The mean value for multipoint contact is 12.9, and the 90th percentile is at 26; hence, this pattern of an amplified effect as market dominance increases holds over most of the observed range for multipoint contact, which supports hypothesis 3a.

Entry by multimarket firms. In table 6, model 1 shows the baseline model, which contains only control variables. Multimarket thrifts with large asset bases were more likely to expand into new markets, similar to their behavior with respect to growth in their current markets. Surprisingly, multimarket firms tended to enter markets where their large multipoint rivals operated; however, this coefficient became negative after we added multipoint contact to the model. Multimarket thrifts were also more likely to enter new markets when demographic trends were favorable (when the market size index was high), although these effects became nonsignificant after we added multipoint contact. None of the other control variables had any significant effect on rates of market entry by multimarket firms, although the effect on geographic diversification became statistically significant and positive after we added multipoint contact.

Model 2 shows that multimarket firms were more likely to enter markets where their level of contact with multipoint rivals was high. In contrast, model 3 shows that the relationship between the number of multimarket firms and entry has an inverted-U shape. This effect peaks within the observed range for multipoint contact (0 to 30) at a value of 23.5, supporting hypothesis 1b. Multimarket firms gained footholds in territories where there was a moderate level of multipoint contact, thereby increasing their ability to exchange threats and gather information about competitors, but they were restrained from aggressively entering markets where there was a high level of multipoint contact. The multiplier of the rate of entry at the average level of multipoint contact is 3.50, which indicates that, on average, the presence of multipoint rivals more than trebled rates of market entry by multi-

Table 6

Hazard-Rate Estimates of Market Entry by Multimarket Firms*

Variable	1	2	3	4	5	6	7
Constant	–5.33•••	–7.63•••	–7.47•••	–6.74•••	–6.86•••	–6.48•••	–6.66•••
	(1.22)	(1.57)	(1.55)	(1.57)	(1.55)	(1.57)	(1.55)
Focal firm size	.337••	.545•••	.545•••	.532•••	.533•••	.522•••	.525•••
	(.110)	(.123)	(.124)	(.122)	(.123)	(.123)	(.122)
Geographic diversification	–.502	3.32•••	2.57•••	2.72•••	2.33••	2.71•••	2.32••
	(.576)	(.809)	(.769)	(.807)	(.774)	(.805)	(.774)
Market size	.431•••	.049	.045	.040	.038	.050	.052
	(.029)	(.041)	(.044)	(.043)	(.045)	(.044)	(.045)
Multipoint rivals' size	.540•	–.878••	–.772••	–.668•	–.646•	–.660•	–.616•
	(.215)	(.268)	(.284)	(.271)	(.283)	(.270)	(.286)
Interest rate gap	.097	.176	.174	.163	.162	.154	.166
	(.104)	(.123)	(.126)	(.125)	(.126)	(.123)	(.124)
Regulatory period	–.709	–.491	–.410	–.441	–.382	–.443	–.418
	(.443)	(.520)	(.524)	(.519)	(.521)	(.513)	(.514)
GSP/1000	–.216	–.088	–.168	–.137	–.191	–.161	–.197
	(.229)	(.268)	(.270)	(.272)	(.273)	(.271)	(.270)
Multipoint contact (MPC)		.188•••	.335•••	.164•••	.294•••	.131•••	.152••
		(.014)	(.033)	(.013)	(.034)	(.024)	(.057)
MPC²/100			–.714•••		–.598•••		.195
			(.141)		(.138)		(.277)
Market dominance (MD)				–.957•••	–.688•••	–1.21•••	–1.34•••
				(.161)	(.205)	(.183)	(.295)
MD × MPC						.101•	.409•••
						(.044)	(.109)
MD × MPC²/100							–2.33••
							(.732)
Scale parameter	1.05	1.05	1.10	1.02	1.06	1.01	1.08
Log-likelihood	–2343.6	–2212.5	–2193.1	–2194.5	–2184.2	–2192.7	–2180.3
Degrees of freedom	9	10	11	11	12	12	14

• $p < 05$; •• $p < .01$; ••• $p < .001$, two-tailed *t*-tests.

* These analyses were conducted on pooled, cross-sectional time-series data covering 64,692 firm-market-year observations on multimarket firms, which made 411 market entries between 1977–78 and 1990–91. Standard errors are in parentheses.

market firms over what they would have been if only single-market rivals operated there.

Model 4, which contains only the linear term for multipoint contact, shows that multimarket firms were less likely to enter markets dominated by one or a few large firms. Model 5 adds the quadratic term for multipoint contact and again shows a negative coefficient on market dominance. The results in both of these models support hypothesis 2b. This effect is substantial: the average multiplier of multimarket firms' market entry rates, calculated using model 5, is .652, which indicates that the average level of market dominance by multimarket firms reduced multimarket firms' market-entry rates by one-third from what they would have been if the focal markets were not dominated by a few large firms. Models 5 and 6 show that the effect of multipoint contact on market entry is moderated by market dominance: interactions between market dominance and multipoint contact are positive for the linear term and negative for the quadratic term. The positive estimate on the linear interaction amplifies the positive estimate on the linear main effect; the negative estimate on the quadratic interaction amplifies the negative estimate on the quadratic main effect.

As before, we plotted the effect of MPC_{imt} on multimarket firms' rates of market entry over the observed range of MPC_{imt} and at three levels of market dominance: the mean, the mean plus one standard deviation, and the mean minus one standard deviation. Figure 5 shows these plots and demonstrates that as a market becomes ever more dominated by a few large firms, the impact of multipoint contact is amplified. When market dominance equals .298 ($\mu - \sigma$), the maximum multiplier is 8.26; when market dominance equals .622 (μ), the maximum multiplier is 12.35; and when market dominance equals .947 ($\mu + \sigma$), the maximum multiplier is 20.74. The mean value for multipoint contact in this subsample is 4.10 and the 90th percentile is at 11; hence, this pattern of an amplified effect as market dominance increases holds over most of the observed range for multipoint contact. This pattern of results supports hypothesis 3b.

Growth by single-market firms. Table 7 presents results for our analysis of the growth of single-market firms within their sole established market. Model 1 is a baseline model and shows that single-market firms with large asset bases were more likely to grow. Further, single-market firms were more likely to grow in the earlier regulatory period (before 1982) and when general economic conditions were poor.

Model 2 adds the extent of multipoint contact among multimarket firms and shows a positive but nonsignificant effect for multipoint contact. This result supports neither hypothesis 1c nor hypothesis 1c alt.: the level of multipoint contact among multimarket firms in a regional market had no bearing on whether or not single-market firms expanded their branch-office networks within that market. Model 3 adds market dominance and shows a negative effect, which supports hypothesis 2c. In markets dominated by a few large firms, single-market firms were less likely to grow. The effect of market dominance was quite strong: the multiplier at the average level of market dominance was .582, which indicates that, on average, single-market firms' growth rates were decreased by 42 percent from what they would have been had market dominance not mattered. Finally, model 4 shows

Figure 5. Multiplier of the entry rate for multimarket firms (effect of multipoint contact evaluated at three values of market dominance).

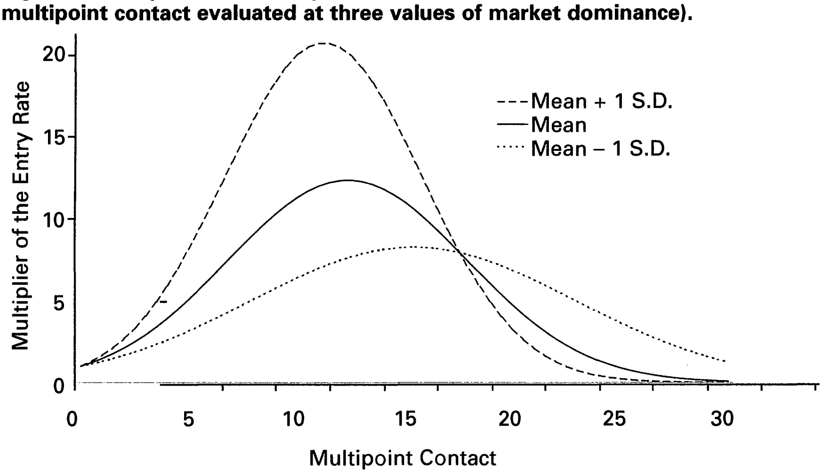


Table 7

Hazard-Rate Estimates of Growth in Current Markets by Single-market Firms*

Variable	1	2	3	4
Constant	1.72	1.32	2.39	2.40
	(1.19)	(1.26)	(1.33)	(1.34)
Focal firm size	.240•••	.229•••	.242•••	.242•••
	(.061)	(.062)	(.064)	(.065)
Market size	.015	–.037	–.012	–.012
	(.029)	(.051)	(.052)	(.052)
Multimarket firms' size	–.106	–.179	–.091	–.094
	(.312)	(.316)	(.318)	(.321)
Interest rate gap	.078	.103	.078	.078
	(.078)	(.081)	(.081)	(.082)
Regulatory period	–.796•	–.844•	–.733	–.735
	(.368)	(.382)	(.382)	(.383)
GSP/1000	–.539•	–.484•	–.545•	–.545•
	(.214)	(.225)	(.223)	(.223)
Multipoint contact (MPC)		.277	–.062	–.075
		(.212)	(.254)	(.349)
Market dominance (MD)			–1.73•	–1.77
			(.758)	(.945)
MD × MPC				.066
				(.121)
Scale parameter	.995	.993	.996	.995
Log-likelihood	–508.2	–507.4	–505.0	–505.0
Degrees of freedom	8	9	10	11

• $p < 05$; •• $p < .01$; ••• $p < .001$, two-tailed *t*-tests.

* These analyses were conducted on pooled, cross-sectional time-series data covering 1,141 firm-market-year observations on single-market firms, which experienced 216 growth events between 1977–78 and 1990–91. Standard errors are in parentheses.

no significant interaction between market dominance and multipoint contact among multimarket firms. Thus, we find no support for hypothesis 3c.

Entry by single-market firms. In table 8, model 1 is the baseline model. Large single-market firms were more likely to expand into new regional markets, presumably because large firms had the resources needed to support such expansion. Single-market firms were more likely to enter markets that were attractive in terms of demographics and markets where large multimarket firms operated, although the effect of multimarket rivals' size became negative after we added multipoint contact to the model. Single-market firms were also consistently more likely to enter new markets before 1982.

Model 2 adds multipoint contact among multimarket firms. It shows a positive effect on multipoint contact, indicating that single-market firms tended to enter markets where multimarket incumbents had a dense network of joint-location ties. This result, which supports hypothesis 1d and fails to support hypothesis 1d alt., indicates that there are strong positive spillovers from multi- to single-market firms. The multiplier at the average level of multipoint contact was 2.74, which indicates that, on average, multipoint contact among multimarket firms increased single-market firms' rates of market entry more than two and one-half times over what those rates would have been if only single-market firms operated.

Table 8

Hazard-Rate Estimates of Market Entry by Single-market Firms*

Variable	1	2	3	4
Constant	–9.00••	–11.1•••	–10.7•••	–9.91•••
	(1.98)	(2.35)	(2.39)	(2.36)
Focal firm size	.603•••	.630•••	.631•••	.639•••
	(.123)	(.134)	(.134)	(.133)
Market size	.445•••	–.137•	–.122•	–.136•
	(.024)	(.068)	(.057)	(.062)
Multimarket firms' size	1.70•••	1.33••	1.34••	1.10•
	(.399)	(.440)	(.435)	(.439)
Interest rate gap	–.069	.106	.095	.088
	(.156)	(.175)	(.177)	(.176)
Regulatory period	–2.18•••	–2.69•••	–2.64•••	–2.70•••
	(.567)	(.690)	(.692)	(.695)
GSP/1000	–.058	.205	.181	.136
	(.350)	(.438)	(.438)	(.446)
Multipoint contact (MPC)		2.03•••	1.90•••	1.43•••
		(.182)	(.204)	(.267)
Market dominance (MD)			–.464	–1.12•
			(.332)	(.511)
MD × MPC				2.74•••
				(.762)
Scale parameter	1.06	1.07	1.09	1.22
Log-likelihood	–1143.6	–1064.4	–1063.7	–1056.5
Degrees of freedom	8	9	10	11

• $p < 05$; •• $p < .01$; ••• $p < .001$, two-tailed *t*-tests.

* These analyses were conducted on pooled, cross-sectional time-series data covering 65,037 firm-market-year observations on single-market firms, which made 194 market entries between 1977–78 and 1990–91. Standard errors are in parentheses.

Model 3 shows that market dominance has the expected negative effect on market entry by single-market firms, but this effect is nonsignificant, perhaps due to multicollinearity: the correlation between multipoint contact and market dominance was moderately high ($r \approx .60$). We estimated a model, not shown here, without multipoint contact; in this model, the coefficient on market dominance was negative and highly significant ($p < .001$). This pattern of effects supports hypothesis 2d. Model 4 adds an interaction between multipoint contact and market dominance and shows a positive effect, supporting hypothesis 3d. The positive spillovers from multi- to single-market firms seem to be more pronounced in markets dominated by a few large players.

DISCUSSION

The results presented above demonstrate that multimarket contact strongly influences firms' market entry and growth behavior. Table 9 summarizes these results. Each row in this table shows one of the explanatory variables in our theory; each column, one of the outcome variables. The first line of each cell notes the shape of the effect found in our empirical analysis; the second line notes which hypothesis was tested and whether it was supported.

Main effects of multimarket contact. Holding constant firm characteristics, market size, rivals' size, and macroeconomic factors, multimarket firms seek to embed themselves in interfirm networks by entering and growing in markets where

Table 9

Summary of Empirical Results*

	Table 5 Multimarket firms: Growth in current markets	Table 6 Multimarket firms: Entry into new markets	Table 7 Single-market firms: Growth in current markets	Table 8 Single-market firms: Entry into new markets
Multipoint contact (MPC)	∩	∩	∅	
	H1a supported	H1b supported	H1c not supported H1c alt. not supported	H1d supported H1d alt. not supported
Market dominance (MD)	–	–	–	–
	H2a supported	H2b supported	H2c supported	H2d supported
MD × MPC	∩	∩	∅	
	H3a supported	H3b supported	H3c not supported	H3d supported

* Each column presents results for one outcome variable; each row, for one explanatory variable. The top line in each cell shows an empirical result; below this, we note whether this result supported the relevant hypothesis (or hypotheses).∩ indicates a statistically significant inverted-U-shaped effect, + a positive effect, – a negative effect, and ∅ a non-significant effect.

they experience a moderate level of multipoint contact. This suggests that three distinct forces influence the competitive behavior of multimarket firms. First, multimarket firms forbear from aggression against their multipoint rivals; hence, they do not grow in or enter markets where they experience high levels of multipoint contact. Second, multimarket firms seek mutual footholds as foundations for the system of implied restraint that keeps multipoint rivals in check; hence, they do not grow in or enter markets where they experience low levels of multipoint contact. Third, multimarket firms seek more information about multipoint competitors so as to reduce uncertainty about these competitors' future behavior; hence, they do not grow in or enter markets where they experience low levels of multipoint contact. These three forces act in tandem to yield curvilinear (inverted-U-shaped) relationships between the level of multipoint contact, on the one hand, and rates of growth and entry, on the other. Multipoint contact has a slightly stronger effect on entry than on growth. At the mean values for multipoint contact, the multiplier of the entry rate is 3.50, while the multiplier of the growth rate is 3.18. This difference may reflect the fact that firms are more concerned with keeping new rivals out of their domains than they are with keeping existing rivals small.

Single-market firms also seek to embed themselves in interfirm networks by entering markets characterized by high levels of multipoint contact. Presumably, in such markets, mutual forbearance among multimarket incumbents is great. This result suggests that spillovers from mutual forbearance among multimarket firms are positive, congruent with the analysis of Bernheim and Whinston (1990). Actions taken by multimarket firms to limit aggression, such as relaxing interest rates, raising fees, and scaling back advertising, are not narrowly focused on multipoint rivals but, instead, benefit both single- and multipoint rivals.

There is another possible explanation for the observed effect of multipoint contact: single-market firms might enter new markets to gain footholds in their competitors' domains and enter the mutual exchange of implied threats and understood restraint that binds multimarket firms together. If this were true, analyses of single-market firms would show the same inverted-U-shaped relationship with multipoint contact as do analyses of their multimarket competitors. To investigate this possibility, we estimated an additional model, not shown in table 8, in which we included a quadratic term for multipoint contact, and did find an inverted-U-shaped effect. The coefficient on the linear term for multipoint contact was 3.98, the coefficient on the quadratic term was –.0083, and both were significant at $p < .001$. The log-likelihood for this model was –1052.7, which indicates a significant improvement in fit to the data over model 2 in table 8. The peak of this effect occurred at 2,409, which lies within the observed range for MPC_{mt} (0 to 2,486). This pattern of results suggests that single-market firms seeking to expand into new markets—and, in doing so, to become multimarket firms—must maintain a balance between gaining footholds in rivals' territories and better competitor intelligence, on the one hand, and shying away from strong aggression in the face of their would-be multipoint rivals, on the other.

Contrary to our expectations, multipoint contact had no effect on single-market firm growth. There may be two reasons for this null effect. First, as with multimarket firms, it may be that multimarket contact has stronger effects on entry than on growth. Second, it may be that the functioning of multimarket networks is not particularly relevant to isolates like single-market firms. Single-market firms' actions may be shaped by such networks only when they are about to become members of those networks by entering new regional markets and transforming themselves into multimarket players.

Main effects of market dominance. Market structure, specifically, the extent to which a market is dominated by one or a few large players, decreases growth and entry by both multi- and single-market firms. This pattern of results suggests that, as expected, markets dominated by a few large firms are not attractive places for any firms looking for new markets. Our finding that all firms are affected by overall market structure contrasts sharply with our finding that only current or potential multimarket firms are affected by multipoint contact.

Interaction effects. Market dominance amplifies the effects of multipoint contact on multimarket firm growth and entry, as well as single-market firm entry. Taken together, these results indicate that the complex webs of opportunity and constraint created by multipoint contact have different effects on firm behavior in markets characterized by different levels of market dominance. Overall market structure, specifically, the extent to which a market lies clearly within the sphere of influence of a few large players, sets the stage within which multipoint competitive dynamics unfold. As with the main effect of multipoint contact, this interaction effect is stronger in magnitude for entry into new markets than for growth within current markets. At the mean values for multipoint contact and market dominance, the maximum multiplier of the multimarket firm entry rate is 20.74, while the maximum multiplier of the multimarket firm growth rate is 6.94. As before, we suspect that this difference is due to the fact that firms are more concerned with keeping new rivals out of their domains than with keeping existing rivals small.

A Note on Resource-partitioning Theory

The theory of resource partitioning in industrial systems (Carroll, 1985) distinguishes between generalists, firms that depend on a wide range of resources for survival, and specialists, firms that depend on a narrow range of resources for survival. This distinction is exemplified by general-interest newspapers versus newspapers that appeal to a particular neighborhood, ethnic group, or profession. This theory connects two common phenomena: increasing market concentration and the appearance of many small, specialized players in mature industries. The theory predicts that when an industry is unconcentrated, generalists tend to spread out and occupy a large proportion of the resource space. In contrast, when an industry is concentrated, generalists tend to cluster in the core of the industry and tend not to occupy peripheral resource spaces. Thus, when there are many generalists and industry concentration is low, excess resources—even those in the periphery—tend to be unavailable to specialist players, but when there are few generalists and industry concentration is high, resources in the periphery tend to be available for exploitation by specialists.

At first glance, resource-partitioning theory appears to be germane to the interactions among single- and multipoint rivals that we analyzed here. But there is a crucial difference between the situation analyzed by Carroll (1985) and the situation we studied. Carroll defined the three key concepts in his theory at the same level of analysis: he defined specialist and generalist firms at the city level, by assessing whether or not firms in a metropolitan area published general-interest newspapers; he defined market concentration at the city level, by calculating the Gini index of concentration among generalists within a metropolitan area; and he defined survival, the outcome of interest at the city level, by measuring the survival or failure of a newspaper-publishing organization in that metropolitan area. In contrast, we defined the four key concepts in our theory at different levels of analysis: we defined single- and multimarket firms at the state level, by determining whether firms operated in a single county or multiple counties in California; we defined market dominance at the county level, by measuring the proportion of each county market controlled by the four largest multimarket incumbents; we defined multimarket contact at the level of the firm in the county or the firm (for multimarket firms, by counting the markets outside the focal county where the focal firm meets multipoint rivals; for single-market firms, by summing multipoint contact across all multimarket firms in the focal market); and we defined the outcomes of interest, growth in a current market and entry into a new market, at the level of the firm in the county. Our study is therefore more microscopic than Carroll's. To illustrate, if Carroll had analyzed entry into or exit from particular reader segments targeted by general- and special-interest newspapers, rather than the survival of entire newspaper-publishing organizations, he would have done something similar to what we did here.

Because of differences between Carroll's study and ours in the levels at which key concepts are defined, theoretical relationships that are central to the two theories are not exactly analogous. In particular, the relationship in our theory between the multipoint contact and market-level growth or entry is not analogous to the relationship in resource-partitioning theory between concentration and survival. For this reason, we do not integrate resource-partitioning theory into our theory of competition in multiple geographic markets. Having said this, we recognize that it would be appropriate to extend Carroll's analysis of specialists and generalists to firms whose positions are defined by location in physical space, rather than product/client space. To do so, however, one would have to conduct a different analysis than the one we report here. One would have to assess the consequences of contact between generalists and specialists at the state level. More concretely, one would have to analyze the aggregate behavior (e.g., growth across the entire state) of firms that operate in multiple versus single county markets, as a function of aggregate (state-level) multipoint contact. To do this, one would have to modify our measures of multipoint contact by measuring contact between a focal multimarket firm and its multipoint rivals across all 58 counties in California. Such a study would elaborate Carroll's pioneering analysis by using a finer-grained firm-level measure of contact between firms. Concentration is the same for all firms, but multipoint contact varies across firms. For example, multipoint contact would be low for multimarket firms that operate in only two small rural counties but high for multimarket firms that operate in many large urban counties.

Implications

The embeddedness of firms within network structures created by interaction across multiple geographic markets has important implications for competitive behavior. Our analysis of firm growth demonstrates that markets where multimarket firms experience a moderate level of multipoint contact with incumbents are attractive locations for expansion. Even more interestingly, our analysis demonstrates that firms actually seek to embed themselves in interfirm networks: by entering markets where they experience a moderate level of multipoint contact, firms increase the strength of joint-location ties to multipoint rivals and thereby increase their interdependence with those rivals. Rather than viewing strong, multiplex ties that derive from meeting rivals in multiple geographic markets as constraints on their strategic opportunities, firms seem to see them as opportunities to attenuate competitive behavior and limit the negative consequences of competition.

All firms are affected by the presence of relationships across markets. Although in one respect single-market firms fit into the traditional network-analytic role of isolates, outside the multimarket network, they are still strongly affected by the multimarket network. Our results suggest that while they may not be part of the interfirm networks that are created by operating in multiple shared markets, single-market firms are more likely to enter structured markets, where multimarket incumbent firms have high levels of multipoint contact.

Because single-market firms behave differently in settings that have different densities of multimarket networks, multimarket network structures must be evaluated for all market incumbents, whether or not they are currently members of these networks.

Our findings suggest that mutual forbearance is a complex process. In formulating their entry and growth strategies, firms take account of the presence of multipoint rivals, the size of those rivals, and the degree to which a few firms dominate the market. The phenomenon is far more than a simple wink and nod between large oligopolists; instead, it appears to involve a series of steps designed to position the firm at just the right spot within the network of linked markets.

Future research could undertake more fine-grained analyses of multipoint contact and competition, moving in three directions. First, future research could analyze shrinkage and exit from existing markets, which represent the flip side of growth and entry. Second, future research could explore the effects of traditional measures of network position, such as size and centrality, on the strategic decisions of individual firms. Such an analysis would allow us to make even more direct connections between the firm strategies and market structures that drive competition. Third, future research might explore whether some firms are more or less successful at navigating the complex web of relationships that underpins mutual forbearance, examining the performance implications of the expansion and contraction that is driven by multimarket contact and mutual forbearance.

The results shown here should be generalizable to many, but not all, other industries. The theory of mutual forbearance assumes that firms can coordinate their activities across multiple markets and engage in a subtle give and take with competitors. Such mutual forbearance is likely to be strongest in industries where activities can be or are controlled by a single firm-level strategy. In competitive arenas where markets differ greatly from one another in terms of product attributes, and therefore in terms of necessary production and distribution technologies, or in terms of clientele, and therefore in terms of product attributes that are most highly valued, mutual forbearance will be more difficult to implement. For example, product/client markets that cover a diverse range of products may be difficult to organize because the competitive strategies used in one market or product category may not be able to be coordinated with those used in another market or product category. This means that future research should investigate the boundary conditions for our theory of multimarket contact and mutual forbearance. But, given the results of the study reported here, single-market firms should not be left out of the equation.

Finally, our finding of positive spillovers from multi- to single-market firms, which confirms the speculations of Bernheim and Whinston (1990), may not generalize to all other industries. Indeed, it is possible that similar positive spillovers will be found only in settings where the fixed costs of operating in any particular market are low and both entry and exit barriers are low, while the negative spillovers predicted by Barnett (1993) will be seen when fixed costs and entry and exit barriers are high. Clearly, more empirical work is needed to determine the conditions under which mutual forbearance among multimarket firms creates beneficial actions, rather than harmful ones, that spill over to single-market firms.

REFERENCES

Allison, P. D.
1995 Survival Analysis Using the SAS System: A Practical Guide. Cary, NC: SAS Institute.

Barnett, W. P.
1993 "Strategic deterrence among multipoint competitors." Industrial and Corporate Change, 2: 249–278.

Baum, J. A. C., and H. A. Haveman
1997 "Love thy neighbor? Differentiation and spatial agglomeration in the Manhattan hotel industry." Administrative Science Quarterly, 42: 304–338.

Baum, J. A. C., and H. J. Korn
1996 "Competitive dynamics of interfirm rivalry." Academy of Management Journal, 39: 255–291.

Bernheim, B. D., and M. D. Whinston
1990 "Multimarket contact and collusive behavior." RAND Journal of Economics, 21: 1–26.

Berry, C. H.
1974 Corporate Growth and Diversification. Princeton, NJ: Princeton University Press.

Blau, P. M.
1977 Inequality and Heterogeneity. New York: Free Press.

Boeker, W. P., J. Goodstein, J. Stephan, and J. P. Murmann
1997 "Competition in a multimarket environment: The case of market exit." Organization Science, 8: 126–142.

Burt, R. S.
1980 "Autonomy in a social topology." American Journal of Sociology, 85: 892–925.
1982 Toward a Structural Theory of Action. New York: Academic Press.

Carroll, G. R.
1985 "Concentration and specialization: Dynamics of niche width in populations of organizations." American Journal of Sociology, 90: 1262–1283.

Caves, R. E., and M. E. Porter
1977 "From entry barriers to mobility barriers: Conjectural decisions and contrived deterrence to new competition." Quarterly Journal of Economics, 90: 241–261.

Cliff, A. D., and J. K. Ord
1973 Spatial Autocorrelation. London: Pion.

Doreian, P.
1980 "Linear models with spatially distributed data: Spatial autocorrelation or spatial effects?" Sociological Methods and Research, 9: 29–60.
1981 "Estimating linear models with spatially distributed data." In S. Leinhardt (ed.), Sociological Methodology 1981: 359–388. San Francisco: Jossey-Bass.

Dow, M. M.
1984 "A biparametric approach to network autocorrelation: Galton's problem." Sociological Methods and Research, 13: 201–217.

Edwards, C. D.
1955 "Conglomerate bigness as a source of power." In G. Stigler (ed.), Business Concentration and Price Policy: 331–359. Princeton, NJ: Princeton University Press.

Evans, W. N., and I. N. Kessides
1994 "Living by the 'golden rule': Multimarket contact in the U.S. airline industry." Quarterly Journal of Economics, 109: 341–366.

Fligstein, N. D., and K. Dauber
1989 "Structural change in corporate organization." In W. R. Scott (ed.), Annual Review of Sociology, 15: 73–96. Palo Alto, CA: Annual Reviews.

Friedland, R., and D. Boden
1994 "NowHere: An introduction to space, time, and modernity." In R. Friedland and D. Boden (eds.), NowHere: Space, Time, and Modernity: 1–60. Berkeley: University of California Press.

Friedland, R., and D. Palmer
1984 "Park Place and Main Street: Business and the urban power structure." In R. Turner (ed.), Annual Review of Sociology, 10: 393–416. Palo Alto, CA: Annual Reviews.

Friend, I. (ed.)
1969 Study of the Savings and Loan Industry. Washington, DC: Federal Home Loan Bank Board.

Gart, A.
1989 An Analysis of the New Financial Institutions: Changing Technologies, Financial Structures, Distribution Systems, and Deregulation. New York: Quorum.

Gimeno, J., and C. Woo
1996 "Hypercompetition in a multimarket environment: The role of strategic similarity and multimarket contact in competitive de-escalation." Organization Science, 7: 322–340.
1999 "Multimarket contact, economies of scope, and firm performance." Academy of Management Journal, 43: 239–259.

Greene, W. H.
1990 Econometric Analysis. New York: Macmillan.

Greve, H. R.
1996 "Patterns of competition: The diffusion of a market position in radio broadcasting." Administrative Science Quarterly, 41: 29–60.

Hannan, M. T., G. R. Carroll, E. A. Dundon, and J. C. Torres
1995 "Organizational evolution in a multinational context: Entries of automobile manufacturers in Belgium, Britain, France, Germany, and Italy." American Sociological Review, 60: 509–528.

Haveman, H. A.
1993 "Organizational size and change: Diversification in the savings and loan industry after deregulation." Administrative Science Quarterly, 38: 20–50.

Heggestad, A. A., and S. A. Rhoades
1976 "Concentration and firm stability in commercial banking." Review of Economics and Statistics, 58: 433–452.
1978 "Multimarket interdependence and local market competition in banking." Review of Economics and Statistics, 60: 523–532.

Ingram, P., and J. A. C. Baum
1997 "Chain affiliation and the failure of Manhattan hotels, 1898–1980." Administrative Science Quarterly, 41: 68–102.

Kono, C., D. Palmer, R. Friedland, and M. Zafonte
1998 "Lost in space: Understanding the geography of corporate interlocking directorates." American Journal of Sociology, 103: 863–911.

Levine, S., and P. E. White
1961 "Exchange as a conceptual framework for the study of interorganizational relationships." Administrative Science Quarterly, 5: 583–601.

Liang, K. Y., and S. L. Zeger
1986 "Longitudinal data analysis using generalized linear models." Biometrika, 73: 13–22.

Mester, L. J.
1987 "Multiple market contact between savings and loans." Journal of Money, Credit, and Banking, 19: 538–549.

Mizruchi, M. S.
1982 The American Corporate Network, 1904–1974. Beverly Hills, CA: Sage.

Narroll, R.
1970 "Galton's problem." In R. Narroll and R. Cohen (eds.), A Handbook of Method in Cultural Anthropology: 974–989. New York: Columbia University Press.

Parker, P. M., and L.-H. Röller
1997 "Collusive contact in duopolies: Multimarket contact and cross-ownership in the mobile telephone industry." RAND Journal of Economics, 28: 304–322.

Phillips, O. R., and C. F. Mason
1992 "Mutual forbearance in experimental conglomerate markets." RAND Journal of Economics, 23: 395–414.

Porter, M. E.
1981 "Strategic interaction: Some lessons from industry histories for theory and antitrust policy." In S. Salop (ed.), Strategy, Predation, and Antitrust Analysis: 449–506. Washington, DC: Federal Trade Commission.

SAS Institute
1990a SAS Procedures Guide, Version 6, 3rd ed. Cary, NC: SAS Institute.
1990b SAS/STAT User's Guide, Version 6, 4th ed. Cary, NC: SAS Institute.
1996 SAS/STAT: Changes and Enhancements through Release 6.11. Cary, NC: SAS Institute.

Scott, J. T.
1993 Purposive Diversification and Economic Performance. Cambridge: Cambridge University Press.

Simmel, G.
1950 The Sociology of Georg Simmel. New York: Free Press.

Sørensen, Å. B.
1977 "Estimating rates from retrospective questionnaires." In D. Heise (ed.), Sociological Methodology 1977:209–223. San Francisco: Jossey-Bass.

Thompson, J. D.
1967 Organizations in Action. New York: McGraw-Hill.

Tuma, N. B., and M. T. Hannan
1984 Social Dynamics: Models and Methods. Orlando, FL: Academic Press.

van Witteloostuijn, A., and M. van Wegberg
1992 "Multimarket competition: Theory and evidence." Journal of Economic Behavior and Organization, 18: 273–282.

Winship, C.
1988 "Thoughts about roles and relations: An old document revisited." Social Networks, 10: 209–231.

Winship, C., and M. Mandel
1983 "Roles and positions: A critique and extension of the blockmodeling approach." In S. Leinhardt (ed.), Sociological Methodology 1983–1984: 314–345. San Francisco: Jossey-Bass.