

Love Thy Neighbor? Differentiation and Agglomeration in the Manhattan Hotel Industry, 1898-1990



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Love Thy Neighbor?
Differentiation and
Agglomeration in the
Manhattan Hotel
Industry, 1898–1990

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In this paper, we examine two distinct perspectives that explain entrepreneurs' choice of product and geographic location, which determine demand for the output of a start-up and the competition it faces. According to the differentiation perspective, fear of direct competition pushes firms far apart from similar competitors, while benefits of complementary differences pull firms close to dissimilar competitors. According to the agglomeration perspective, spillovers from adjacent competitors pull firms close to similar competitors. Our analysis of multi-dimensional founding location decisions in the Manhattan hotel industry provides evidence to support a combined perspective in which hoteliers locate new hotels sufficiently close to established hotels that are similar on one product dimension (price) to benefit from agglomeration economies, but different on another product dimension (size), to avoid localized competition and create complementary differences. •

INTRODUCTION

When entrepreneurs found organizations, they make two key decisions: what products to sell and where to locate. First, they decide how similar their products should be to those of established competitors. If their products are too similar to those of established firms, new ventures will not be able to woo customers, but if their products are too different, they must launch extensive educational campaigns to explain the benefits of their products to potential customers. Second, they decide how close to competitors they should locate their new ventures. If they locate too close to competitors, new ventures run the risk of losing business to established rivals, but if they locate too far from competitors, new firms may lose customers who are drawn to a particular location but who are not satisfied with competitors' offerings. Fundamentally, these questions are the concern of basic economics: both cost structure and access to demand depend on product characteristics and geographic location.

Although organizational founding is an important theme in the growing research in organizational ecology (for reviews, see Romanelli, 1991; Aldrich and Wiedenmayer, 1993; Baum, 1996), in large part, this research has treated foundings as identical additions to homogenous organizational populations: the characteristics of new organizations, which define their domains, have not been of central interest. The absence of organization-specific factors in studies of founding stands in sharp contrast to ecological studies of failure and change, in which issues of population heterogeneity long have been conspicuous (Freeman, Carroll, and Hannan, 1983; Petersen and Koput, 1991). Studying heterogeneity in founding is more complicated than studying heterogeneity in failure or change: organizational attributes cannot be used as explanatory variables in analyses of founding because they cannot be observed for organizations that do not yet exist (Delacroix and Carroll, 1983). As a result, the organization itself cannot be the focal point of study (Lomi, 1995). Ecological researchers have sidestepped this complication by considering the population itself as the unit experiencing the events. The problem with this approach is that variations in

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social and economic conditions across the organizational population's habitat will produce differences in founding rates. If not properly accounted for, this heterogeneity will result in specification bias (Hsiao, 1986). Scholars have made some progress on this problem by focusing on differences among foundings within populations, either by specifying more fine-grained population substructures into which organizations are founded (e.g., Baum and Singh, 1994a; Freeman and Lomi, 1994; Baum and Oliver, 1996) or by deriving corrections for unobserved heterogeneity (Lomi, 1995).

While these research directions are promising, we take a somewhat different approach. Complementing past analyses that ask when founding will occur—by any kind of organization within a population, in any location in that population's habitat—we take organizational founding as given and ask what kind of organization is founded and where. Our approach is inherently relational. We view competition among firms as largely a function of their positions relative to each other in the resource space (Simmel, 1950). We are concerned with similarity to (or distance from) established organizations in terms of the attributes of new organizations relative to established ones. We ask: Given that a new organization has appeared, how similar is it to the organizations nearest to it?

Our focus on proximity contrasts with economists' positional approach to location choice. In the characteristics-space model of competition in economics, markets are conceived as N-dimensional spaces. Studying location choice involves first specifying all possible points within this space—termed addresses—and then examining how address densities influence which addresses receive new entrants. Unfortunately, this approach suffers from serious operational problems (artificial and arbitrary addresses, large numbers of addresses, ambiguous risk-set definition) that have undermined efforts to test the model empirically.¹ Consequently, entry-location studies typically either provide descriptive accounts of addresses that were actually filled (e.g., Shaw, 1982; Swann, 1985) or estimate empirical models that are seriously flawed. Because our relational approach does not require specifying addresses where foundings can occur, it avoids these problems.

We focus on choice of product characteristics (production capacity and price) and geographic location as the decisions that differentiate foundings within an organizational population. These choices are particularly critical for businesses for which demand is uncertain, costs of product reconfiguration and geographic relocation are high, and competition is segmented by product type and geography (i.e., competition is localized). We argue that two distinct processes drive entrepreneurs' decisions about how similar their new enterprises' offerings should be to those of established competitors and how close to established competitors they should locate: (1) the fear of direct competition pushes firms far apart from similar competitors, while the benefits of complementary differences pull firms close to dissimilar competitors; and (2) spillovers from adjacent competitors (i.e., agglomeration economies) and institutional forces pull firms close to similar competitors. We develop hypotheses concerning why firms

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The operational difficulties of a positional approach can be seen clearly in Baum and Oliver's (1996) study of day care center founding in which they examined patterns of founding into 120 qualitatively distinct "addresses."

will be subject to one process or the other and test them with data from the hotel industry in Manhattan over the last century.

Competition and the Differentiation of Organizational Domains

Organizations define relations with other organizations by staking out domains: claims about clientele served, goods and services produced, and technologies employed (Levine and White, 1961; Thompson, 1967). The more organizations' domains overlap, the more they require similar resources to thrive—raw materials, labor, financial support, institutional support, and customer demand—and the more strongly they compete (Hawley, 1950; Hannan and Freeman, 1977, 1989; McPherson, 1983). At one extreme, if organizations' domains overlap completely, the potential for competition will be fierce. At the other extreme, if organizations' domains do not overlap at all, they will require entirely different resources and there will be no potential for competition at all. Clearly, product demand and competition both depend on the products a venture proposes to sell and the clients it proposes to serve. And because opportunities and constraints (i.e., customers and competitors) exist in physical space, geographic location is a key defining characteristic of organizational domains that influences the degree of overlap among them and therefore influences competition (Yuchtman and Seashore, 1967; Aldrich and Reiss, 1976; Carroll and Huo, 1986). Supporting this view, recent studies have consistently found that the addition of an organization to a population has stronger competitive effects on neighboring organizations than on those further away (Baum and Singh, 1994a, 1994b; Hannan et al., 1995; Lomi, 1995).

Ecological models of localized competition focus on the importance of domain similarity for intrapopulation competition. In their seminal paper, Hannan and Freeman (1977) outlined a model in which competition among members of an organizational population is localized with respect to size. They conjectured that organizations of different sizes use different strategies and structures and therefore that large and small organizations, although engaged in similar activities, depend on different mixes of resources. Hence, patterns of resource use are specialized to segments of the size distribution, and similarly sized organizations compete most intensely. Studies of banks and life insurance companies (Hannan, Ranger-Moore, and Banaszak-Holl, 1990), health-maintenance organizations (Wholey, Christianson, and Sanchez, 1992), day-care centers (Baum and Mezas, 1993), and credit unions (Amburgey, Dacin, and Kelly, 1994) have provided evidence of size-localized competition. Baum and Mezas (1992) recently examined localized competition along two dimensions particularly germane to competition in the Manhattan hotel industry, geography and price, in addition to size. Supporting their extension of the size-localized model, they showed that Manhattan hotels more similar to one another in terms of size, room price, and geographic location competed more intensely.

In related work, Carroll (1985) proposed a resource-partitioning model, in which competition among large generalist orga-

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nizations to occupy the center of a market frees peripheral resources that are most likely to be used by small specialist organizations. In concentrated markets with a few large generalists, small specialists can exploit more of the available resources without directly competing with large generalists. The model predicts that increased concentration among generalist organizations will increase failure among large generalists and decrease failure among small specialists. Carroll (1985) found support for this model in a study of newspapers. More recent studies of American breweries (Carroll and Swaminathan, 1992), rural cooperative banks in Italy (Freeman and Lomi, 1994), and specialist wineries in California (Swaminathan, 1995) also support this model.

A third localized-competition model is the niche-overlap model (McPherson, 1983; Baum and Singh, 1994a, 1994b). In this model, the potential for competition between any two organizations is conceived to be proportional to the overlap of their resource bases. Potential competition for each organization is measured using overlap density, the aggregate overlap of an organization's resource requirements with those of all others in the population; potential mutualism is measured using nonoverlap density, which aggregates the resource nonoverlaps with all others in the population. Entrepreneurs are unlikely to found organizations in sectors in which overlap density is high. Organizations in such sectors are also less sustainable. Conversely, entrepreneurs are most likely to found organizations in sectors in which nonoverlap density is high because there is no direct competition for resources and there is potential for complementary demand enhancement. For these reasons, high nonoverlap density should also lower failure rates. Baum and Singh (1994a, 1994b) found support for these predictions in a population of day-care centers in Metropolitan Toronto in which resource requirements were defined in terms of geographic location and the ages of the children they had the capacity to enroll.

The operation of localized competition has important implications for industry evolution. According to Hawley (1950: 201–203), localized competition eventually leads to differentiation. Organizations become differentiated as competitive pressures push less-fit competitors out of the market. Losing organizations are transformed either through functional or territorial differentiation, as organizations seek out distinct functions or locations in which they hold a competitive advantage and in which fewer competitors operate (Fombrun, 1986; Barnett and Carroll, 1987; Delacroix, Swaminathan, and Solt, 1989). Differentiation can also lead to the creation of new organizations that complement established organizations, resulting in the emergence of a complex system of differentiated organizations linked by mutualistic interdependencies. Hawley (1950: 209) described two distinct bases for mutualism: commensalism, positive interdependence based on supplementary similarities (e.g., similar organizations work together to enhance each other's institutional standing or sociopolitical legitimacy); and symbiosis, positive interdependence based on complementary differences (e.g., organizations with different capabilities cooperate or transact to the benefit of both).

Ecological models of localized competition have much in common with Hawley's model of competitive processes. But while Hawley's model emphasized that losing competitors are transformed, ecological models have tended to emphasize that losing organizations die and differentiated organizations arise from new births. In general, ecological models of localized competition suggest a pattern of disruptive or segregating selection, which tends to increase differentiation by producing gaps in the distribution of organizational domains rather than a pattern of stabilizing selection, which would lead the organizations to converge on a single domain (Amburgey, Dacin, and Kelly, 1994).

White's (1981) social-constructionist view, that markets exist as a set of induced role structures, rather than preexisting bounded entities, is congruent with Hawley's reasoning.² Strategists create markets or industries conceptually by arranging other firms in a set of niches and then identifying their own firms' roles within the induced set (see also Daft and Weick, 1984; Porac and Thomas, 1990, 1994; Porac et al., 1995). Domains are the reference points around which entrepreneurs conceptualize their firms' competitive positions vis-à-vis those of potential rivals. Entrepreneurs rely on social comparisons to assess their own firms' capabilities and to identify rivals. According to White, each firm seeks to be distinctive and therefore does not compete with other firms but, rather, finds and sustains cooperative roles with respect to one another. Markets and industries are thus systems in which firms seek to limit the need for competition by defining unique positions for themselves. At the same time, firms depend on the market or industry as a social group, or "frame of comparability" (Leifer, 1985: 448), to define their own identities in terms of the similarities and differences they have with other firms (White and Eccles, 1987).

Although there is an explicit geographic component to Hawley's work, White's theory does not discuss geographic location explicitly. There is, however, a component that can be conceived of as location in social-structural space. Studies have shown the strong influence geographic location can have on the social construction of markets in the knitwear (Porac et al., 1995), banking (Walton, 1986; Reger, 1990; Reger and Huff, 1993), retail (Gripsrud and Gronhaug, 1985; Porac and Thomas, 1994), and hotel industries (Lant and Baum, 1995). A natural extension of White's logic about differentiation in social-structural space is to consider differentiation in geographic space. White's theory predicts that differentiation will reduce competition. Each current or potential competitor decides what and how much to produce by looking at the actions and performance of existing competitors, taking into account the difficulties inherent in trying to invade competitors' niches. White's logic suggests that entrepreneurs take into account the difficulties inherent in trying to invade not only competitors' product/client niches but also their geographic niches. Generalized in this way, White's predictions are identical to Hawley's.

The foregoing discussion suggests that entrepreneurs seek to limit competition and increase mutualism by distinguishing their new ventures' domains (i.e., their service locations and

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We are grateful to Lynn Nonnemaker for pointing out this interpretation of White's article.

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product attributes) from those of other organizations in their industry. On the one hand, if entrepreneurs wish to locate close to established firms in geographic space, they can differentiate their product offerings from those of established firms. On the other hand, if entrepreneurs wish to offer products similar to those offered by incumbents, they can locate far away from these firms in geographic space. Thus, entrepreneurs exercise strategic choice, surveying established organizations and selecting structures and domains for their new ventures to optimize their firms' performance given incumbents' structures and domains (Child, 1972).³ Consistent with these ideas, we offer the following hypothesis:

Hypothesis 1: New organizations choose positions on product and geographic dimensions of organizational domain that differentiate them from incumbents. The more similar new entrants are to incumbents in terms of product offerings, the further they choose to locate geographically from incumbents, and the closer new entrants are to incumbents in terms of geographic location, the more different the products they choose to offer.

Locational Economies and the Clustering of Organizational Domains

In contrast to organization theory, spatial economic models generally predict clustering rather than dispersion of firms with similar organizational domains (Greenhut, 1970; Greenhut, Norman, and Hung, 1987). The Research Triangle in North Carolina, the machine-tool district in Germany, Silicon Valley, Route 128, and city hotel and theater districts are all examples of such concentrations of homogeneous organizational activity. The celebrated analysis by Hotelling (1929) described the location pattern for two sellers of a homogeneous product when buyers are evenly distributed along a bounded linear market, e.g., two ice cream vendors at a beach. In Hotelling's model, consumers buy from the nearest seller. Sellers can locate freely and assume that rivals will not react to relocation. This model's equilibrium occurs when the two sellers locate back-to-back in the center of their market.

Spatial models have long been used to analyze product differentiation. Hotelling (1929) indicated that his model could be applied to study product variety. Chamberlin (1933) recognized that location constituted a form of product differentiation and was concerned directly with the implications that product differentiation holds for competitive processes. But it was only with Lancaster's (1966, 1979) pioneering theory of consumption, which proposed that consumers' preferences do not relate to final products but rather to the characteristics embodied in those products, that earlier connections became clear. According to Lancaster, consumers do not purchase "an automobile" per se; rather, they purchase some combination of body style, speed, efficiency, reliability, and so on. Since Lancaster's work appeared, applications of spatial competition models to the theoretical analysis of product location have proliferated (for reviews, see Graitson, 1982; Greenhut, Norman, and Hung, 1987), although empirical studies are rare (but see Shaw, 1982; Swann, 1985, 1987).

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The mathematical models developed by game theorists yield conclusions similar to those of the natural language models of organization theorists (for a review, see Oster, 1990: 219-231).

Studies of product positioning in marketing, which build on Lancaster's model of consumer choice, have focused on the competitive effects of brand location in product space (e.g., Schmalensee, 1978; Farris and Albion, 1980; Hauser and Simmie, 1981). Marketers use spatial representations of product positions and have developed techniques (e.g., multidimensional scaling) to represent markets as "perceptual spaces," find "ideal points" for new product entries, and evaluate competition (Hauser and Simmie, 1981; Nagle, 1984; Rao, 1984). In contrast to the unidimensional construction of product space generally used by spatial economists (for exceptions, see Baumol, 1967; Shaked, 1975; Eaton and Lipsey, 1976), product-space maps generated by marketers are typically multidimensional.

At one time, scholars speculated that clustering of the type demonstrated by Hotelling might be a ubiquitous result of more general spatial models, but subsequent extensions of Hotelling's model suggest that this famous result is sensitive to at least five assumptions. First, market-area models, which extend Hotelling's model to more than two firms, have difficulties with the uniqueness and sometimes the existence of an equilibrium as firms try to avoid being caught in the middle, although the tendency to cluster does not disappear altogether (Lösch, 1954; Mills and Lav, 1964; Eaton and Lipsey, 1975; Rothschild, 1976). Second, if sellers have foresight about future sellers' location plans, the tendency to cluster diminishes. For example, if firms enter a market sequentially, with foresight, each will choose a location such that no subsequent entrant will choose to enter in the interval between it and its nearest neighbor. As a result, firms will be widely spaced (Prescott and Visscher, 1977). Third, extending this model to location in two- or higher-dimensional space is problematic. In one dimension, each organization has at most two neighbors; this limits competition and leads to a single equilibrium. In two-dimensional space, however, any equilibrium must be robust not only to movement up and down a line but also to diagonal movement. In many cases, either no equilibrium exists or several equilibria exist, although firms still tend to cluster (Shaked, 1975; Eaton and Lipsey, 1976).

Fourth, Hotelling's clustering result is sensitive to assumptions about relocation costs. Hay (1976) showed that new entrants can maximize prices and profits in the short run by locating so as to avoid overlaps and competition between their own and rivals' market areas. But that is not a good long-run strategy. When relocation is costly, and firms therefore take a long-run view of location, if entrants locate beside existing firms they will leave wide-open spaces for subsequent entrants. This deters clustering (Hay, 1976): other things being equal, firms locate so as to minimize the risks of enforced relocation and future rival entry. But when firms operate in a market characterized by economies of location (i.e., unequal costs and/or consumption across the space), concentrated location patterns still result from firms seeking proximity to least-cost or highest-demand locations (Greenhut, 1970; Hauser and Simmie, 1981; Greenhut, Norman, and Hung, 1987), even in the face of high relocation costs.

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The fifth and, for our purposes, most crucial extension of Hotelling's model is the introduction of economies of agglomeration or economies of mutual adjacent location (Weber, 1929), which accrue to organizations that locate close to each other. In the context of geographic location, economies of agglomeration include (1) shared infrastructure available to firms that locate close to each other, notably transportation, communication, and ease of supply; (2) informational externalities about demand or the feasibility of production at a particular location that are available to prospective entrants who observe established firms operating there profitably; and (3) reduction of consumer search costs, which increase demand at a particular location, as with geographic clusters of antique shops, theaters, restaurants, and hotels (Graitson, 1982). Some spatial economists have also tried to explain the symbiotic clustering of differentiated sellers in terms of agglomeration economies; for example, see Stuart's (1979) discussion of how shopping malls reduce consumers' search and travel costs.

Two agglomeration economies exist with respect to product space: shared infrastructure and information externalities.⁴ Shared infrastructure pertains to economies of standardization—a company manufacturing nonstandard sizes of paper that do not fit into standard envelopes or photocopiers will not sell much paper (Swann, 1985; Wade, 1995). Informational externalities exist when one firm's success in producing and selling a particular design demonstrates to potential entrants the feasibility of production and strength of demand (Swann, 1985; Wade, 1995). Garud and Kumaraswamy's (1993) study of Sun Microsystems' standard reveals both these factors. By providing producers of rival and complementary products with easy access to its technology, Sun created a broad network of support for its products, including microprocessor, software, and clone producers. Moreover, Sun's organizational support network increases customer confidence in its technology, making customers more likely to adopt. As more customers adopt Sun technology, it becomes increasingly viable for other firms to copy it and produce compatible complementary products, which further enhances customer confidence and adoption. The success of the VHS standard video cassette and the QWERTY standard typewriter keyboard are also often explained in terms of shared infrastructure and informational externalities (David, 1985; Garud and Kumaraswamy, 1993; Wade, 1995).

Even in the presence of high relocation costs, if demand or production feasibility are uncertain, the existence of agglomeration economies can lead firms to cluster to reduce the risks and costs of enforced relocation by locating near other firms. Firms can find the risks associated with clustering less serious than the risks associated with isolation, favoring intraindustry concentration of activity in product and geographic space (Greenhut, 1970; Webber, 1972; Greenhut, Norman, and Hung, 1987; Wade, 1995). Cluster locations are not necessarily optimal, however; they might be selected accidentally or arise from the sequence of early settlement (Arthur, 1989, 1990).

Economies of agglomeration thus provide strong incentives for clustering that differ from those described in Hotelling's

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Consumer search cost reductions are more difficult to envisage in product space (Swann, 1985).

original model. Moreover, incentives for clustering may overwhelm even localized competition (stemming from similarity of organizational domain) when demand is uncertain and relocation costs are high. In such circumstances, entrepreneurs may be willing to pay the costs associated with localized competition at a particular geographic or product location to obtain benefits from economies of location (low costs and/or high demand) and agglomeration (shared infrastructure, informational externalities, and/or low consumer search costs) also accruing at that location. This will cause the clustering of firms in product/geographic space.

The new institutionalism (Meyer and Rowan, 1977; DiMaggio and Powell, 1983) offers a distinctive cultural explanation for why organizations might cluster in product space—a motivation that contrasts sharply with the efficiency motivation offered by the spatial economics literature. Institutionalized belief systems are proposed to account for convergence among organizations. Institutional environments are characterized by the elaboration of rules and requirements to which organizations must conform if they are to receive support and be perceived as legitimate. The domains of organizations in a common institutional environment may converge as they respond to similar regulatory and normative pressures (Orru, Biggart, and Hamilton, 1991) or as they copy successful organizations (Haveman, 1993). When organizations signal their adherence to prescriptions of appropriate conduct, they obtain rewards, such as legitimacy and status (Scott and Meyer, 1983), access to resources (Pfeffer and Salancik, 1978), and smooth market transactions (Orru, Biggart, and Hamilton, 1991). Thus, institutional isomorphism results from positive externalities that organizations gain by conforming to the values and expectations of the institutional environment.

Taken together, arguments from spatial economics and neoinstitutional theory suggest that entrepreneurs may seek to obtain positive externalities or spillover benefits by locating their new ventures' domains (i.e., their service locations and product attributes) very close to those of other organizations already in their industry. Following this logic, new entrants to any particular geographic location will tend to offer products that are very similar to those of established players. Therefore, we hypothesize:

Hypothesis 2: New organizations choose positions on product and geographic dimensions of organizational domain close to those of established firms. The more similar new entrants are to established firms in terms of product offerings, the closer they choose to locate to established firms, and the closer new entrants are to established firms in terms of geographic location, the more similar the products they choose to sell.

Trading off Multiple Product Dimensions: Mixing Differentiation and Agglomeration

Organizational products typically have several important characteristics, e.g., price, size, power, range of features, reliability, and durability. To the extent that product space is multi-dimensional, potential new entrants may be able to trade off among the dimensions of organizational domain, choosing to be similar to incumbents in terms of one product attribute but different in terms of another. If so, new entrants that are similar to established firms on one product dimension and

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dissimilar on another would be able to locate in close geographic proximity to established firms to take advantage of spillover benefits of adjacent location. Therefore, in addition to pure differentiation and pure agglomeration processes, a mixed process may operate in a multidimensional product space:

Hypothesis 3: New organizations choose positions on product dimensions of organizational domain that trade off effects of localized competition with incumbents on some dimensions for benefits of agglomeration economies on others. The more similar new entrants are to neighboring established firms on some product dimensions, the further they choose to locate from neighboring established firms on other product dimensions.

RESEARCH DESIGN

Data

The data used in this study include information on all 614 transient hotels operating in Manhattan any time between 1898 and 1990 (Baum and Mezias, 1992; Baum, 1995). Transient hotels cater to short-term visitors, in contrast to residential hotels, which serve long-term or permanent guests. We excluded residential hotels from our sample. We used four archival sources to construct the data set. Our main source was the *Hotel Red Book*, published annually since 1887, which contains detailed information on the name, number of rooms, location, and room rates of hotels. It is the most comprehensive historical listing of Manhattan hotels in existence. The information contained in the *Red Book* was cross-referenced and supplemented using three additional archives: the *Manhattan Classified (Yellow Pages) Directory*, published since 1929; the *Annual Directory of the Hotel Association of New York City*, published since 1940; and the *Hotel and Travel Index*, published since 1951. Because detailed data are missing for many hotels prior to 1898, the observation period for this study begins in 1898, even though the archival sources begin in 1887. Between 1898 and 1990, 481 transient hotels were founded in Manhattan. A hotel was defined to have been founded in the year it first appeared in any archival source.

Spatial Agglomeration and Differentiation in the Manhattan Hotel Industry

In the hotel industry, incentives exist both for differentiation of organizational domains, to avoid direct competition, and for spatial agglomeration, to obtain benefits from locating close together. Among the most frequently mentioned criteria in the accommodation purchase decision of travelers are geographic location (general destination or city, as well as specific address), price, services, facilities, and image (Wyckoff and Sasser, 1981: xxxviii). Choice of location and of product characteristics are particularly critical for hotels because the costs of relocating and changing product characteristics are high.

One key issue related to the location of a hotel is the balance of supply (capacity) and demand. Hotels compete in relatively local market areas. While some competition exists between various cities and resort destinations for convention and tourist business, competition is most intense within

compact and well-defined geographic areas (Hart and Troy, 1986). Such geographically localized competition notwithstanding, clusters of hotels commonly form because demand for hotel services generally derives from proximity and convenience to points of tourist interest or business activity, i.e., economies of geography (Ellinger, 1977). Hotels' spatial patterns should vary directly with demand for accommodations. Additionally, agglomeration economies resulting from shared infrastructure (a cluster of hotels around a convention center, for example), information externalities to potential entrants about the level of demand or the feasibility of operation, and reduction in consumer search costs all provide incentives for clustering.

All hotels are not equal, however. Throughout its history, the Manhattan hotel industry has been characterized by establishments selling similar but differentiated products varying in scope and scale of services, on the one hand, and quality, on the other. Size is closely tied to the scope and scale of a hotel's services. Large hotels can offer a wider range of services (dining, recreational, and personal) and can cater to a greater variety of clients (e.g., business travelers, corporate meetings, conferences, tourists, tour groups) simultaneously. Large hotels can provide these diverse services on a larger scale than can smaller hotels. Price is closely tied to the quality of services a hotel provides (Hart and Troy, 1986). Hotels have traditionally positioned themselves in three basic service categories: economy, midprice, and luxury. Economy hotels appeal to budget-minded travelers who want reasonably priced rooms and are willing to accept limited services. Midprice service is modest but sufficient to the needs of business people on expense accounts. Luxury hotels provide upscale restaurants and lounges, concierge service, and private meeting and dining room facilities.

Size and price segmentation in the hotel industry results in specialized patterns of resource use and localized competition (Baum and Mezias, 1992). Large generalist hotels compete to occupy the center of the market, i.e., the locations for which demand is most dense. By comparison, small hotels compete in locations that large hotels cannot serve effectively or that are too small to sustain large-scale operations. As a result, similarly sized hotels will tend to compete most intensely. Analogously, similarly priced hotels compete most intensely. Thus, the primary mode of competition is between hotels of similar size and price class within relatively compact geographic areas.

This discussion suggests that incentives for locating new hotels near established ones will be traded off against product competition among neighboring hotels. Thus, the most desirable hotel locations may be neither closer to nor further from other hotels: the benefits of mutual geographic location must be balanced against the costs of localized product competition. In support of these arguments, Baum and Mezias's (1992) study of hotel failure in Manhattan provided evidence of both localized competition (in terms of geographic location, size, and price) and substantial agglomeration economies. Hence, the Manhattan hotel industry provides an excellent site in which to investigate how the push and pull of localized competition and agglomeration economies jointly

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influence founding entrepreneurs' decisions about product characteristics and geographic location.

Figures 1a–1e and 2a–2e show the evolution of the Manhattan hotel industry in product characteristic and geographic space at 20-year intervals. In these jittered scatterplots, each hotel is given a height representing its size (in figures 1a–1e) or price (in figures 2a–2e). To locate hotels in geographic space, the point representing the size or price of a hotel is connected by a vertical line with the horizontal plane formed by the street/avenue grid. As the figures show, although there has been a tendency to cluster hotels in geographic and product space, by no means has this tendency produced well-defined groupings.

Clustering is clearest in geographic space. Throughout the observation period, hotels were increasingly concentrated at midtown Manhattan (the area bounded by 30th and 60th streets and by Park and 8th avenues), near areas of business activity, tourist interest, and travel facilities. Although this cluster remained dominant, by 1980 industry decline had split midtown hotels into two clusters: a larger one at the south end of Central Park (59th St. between 5th and 8th av-

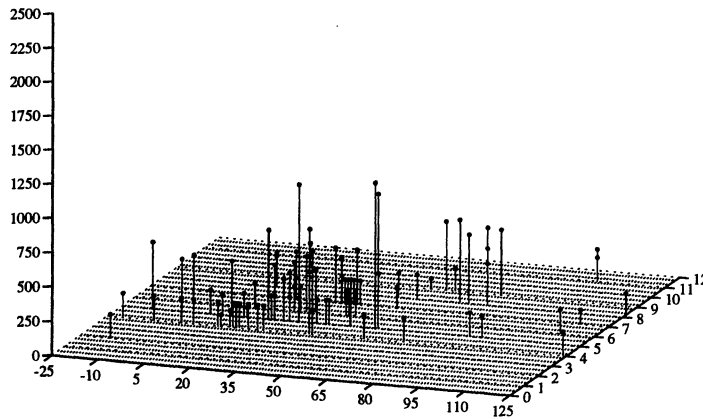


Figure 1a. Manhattan hotel size by geographic location, 1900.

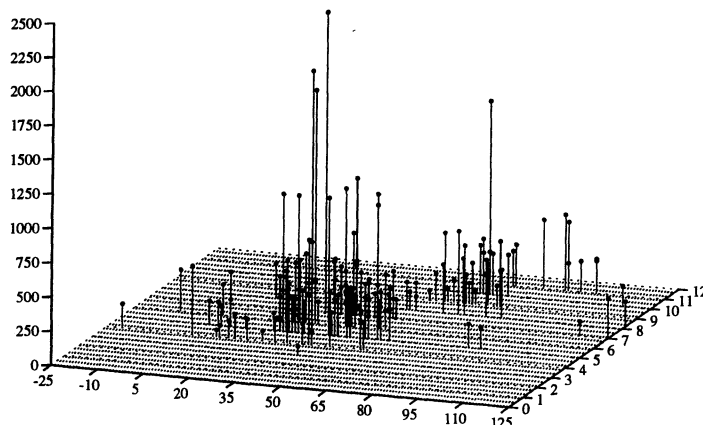


Figure 1b. Manhattan hotel size by geographic location, 1920.

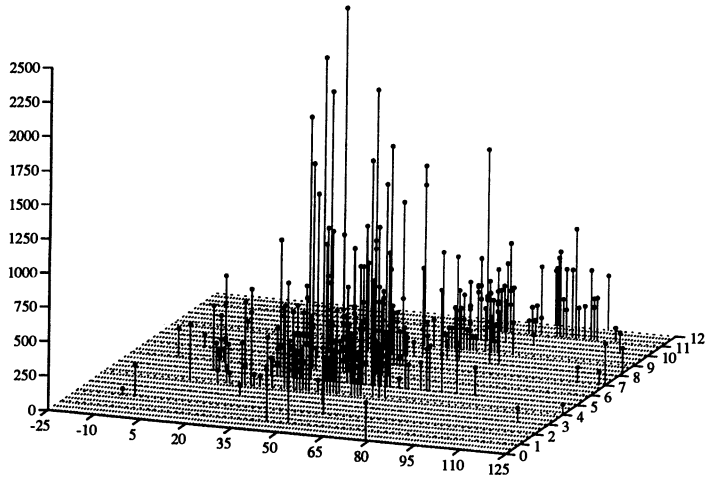


Figure 1c. Manhattan hotel size by geographic location, 1940.

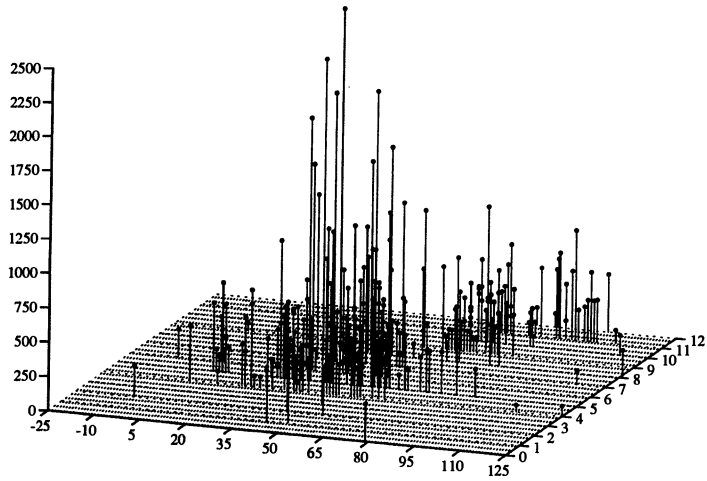


Figure 1d. Manhattan hotel size by geographic location, 1960.

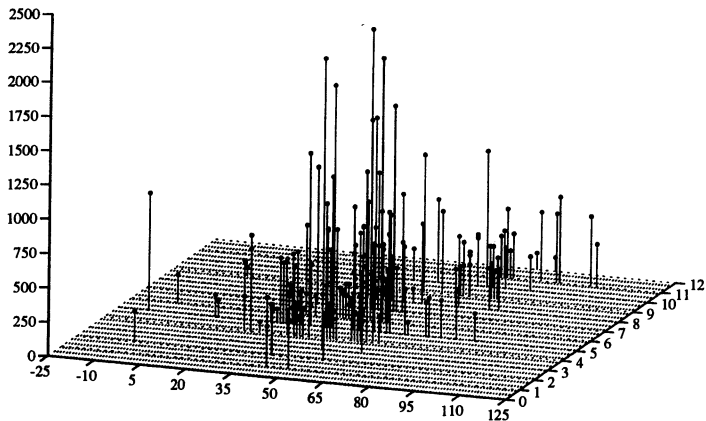


Figure 1e. Manhattan hotel size by geographic location, 1980.

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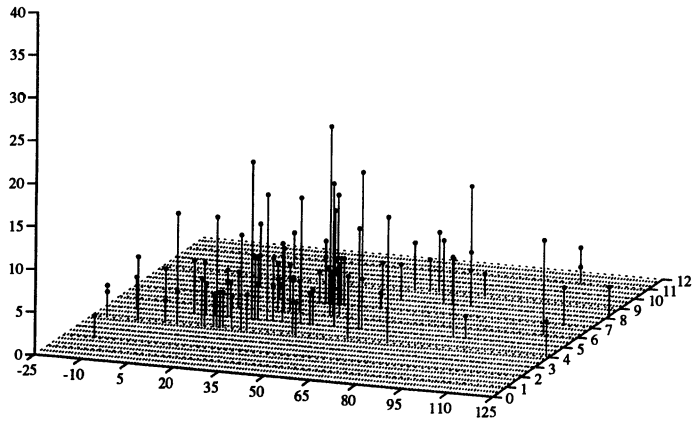


Figure 2a. Manhattan hotel room price by geographic location, 1900.

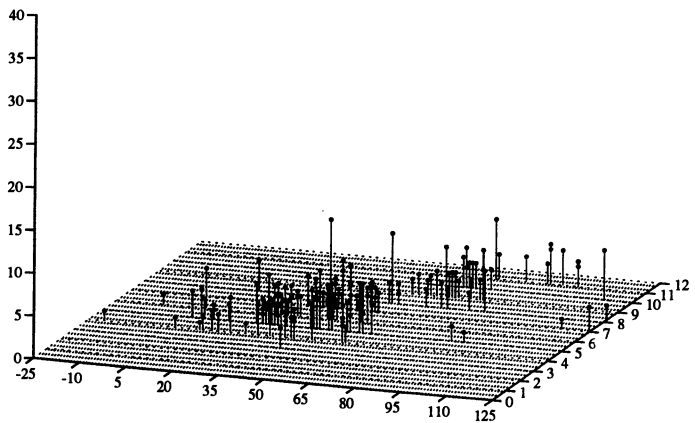


Figure 2b. Manhattan hotel room price by geographic location, 1920.

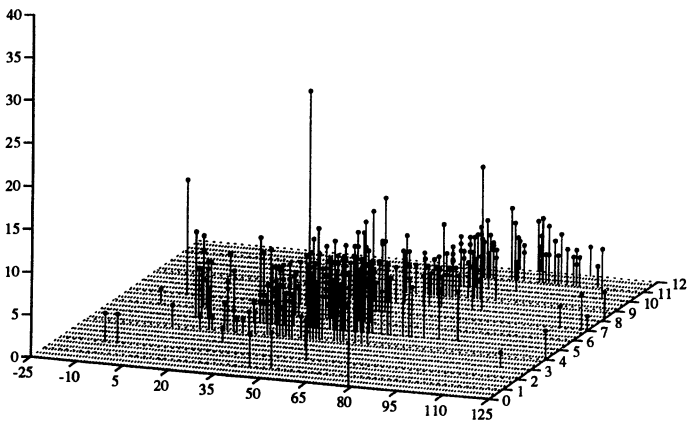


Figure 2c. Manhattan hotel room price by geographic location, 1940.

enues) and a smaller one near Times Square (42nd Street and Broadway). By 1920, a second cluster of hotels had emerged on the Upper West Side (the region above 60th Street and 8th Avenue). Although this cluster expanded rapidly by 1940, in 1980 it contained fewer hotels than it did in 1920. By 1940, a significant number of hotels had also been established along Manhattan's East Side, and these remained in 1980.

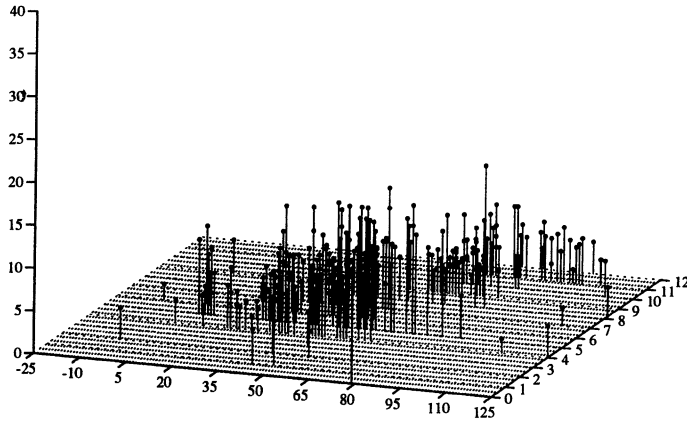


Figure 2d. Manhattan hotel room price by geographic location, 1960.

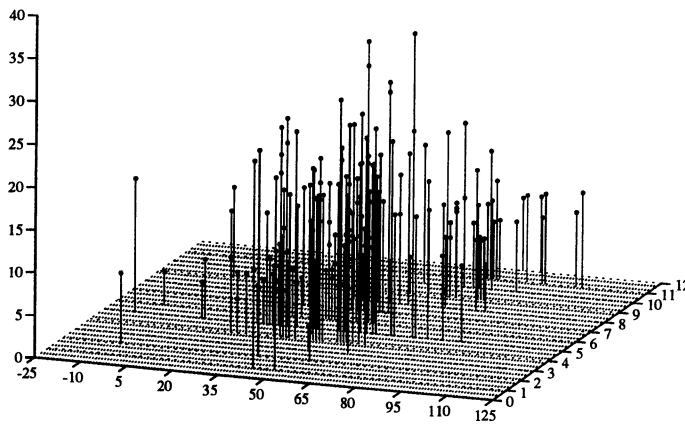


Figure 2e. Manhattan hotel room price by geographic location, 1980.

Clustering is also obvious in terms of size and price. The largest hotels have always located where the demand for hotel services is densest, in midtown Manhattan—very few hotels with more than 1,000 rooms were ever established outside this area. Most exceptions to this rule were hotels near Central Park. Historically the pattern of clustering in terms of price has been broadly similar to the pattern for size, with the most luxurious hotels established at Midtown and Central Park locations. Although large and luxury hotels have concentrated in midtown Manhattan, many other kinds of hotels have located there as well. As a result, midtown Manhattan has had by far the greatest diversity (as well as greatest number) of hotels. Indeed, far greater product homogeneity is found among hotels established in locations less convenient to business activity and tourist attractions, where the kinds of products (typically smaller in size and lower in price) that can be offered are more constrained. Location choices of Manhattan hoteliers have thus created a diverse set of competitors where demand is densest and more homogeneous groupings of competitors away from those locations. Of course, rich, patterned substructures may underlie these aggregate phenomena that we cannot discern graphically. Therefore, we now turn to the question of whether, after controlling for alternative explanations, hoteliers' location choices were influenced by incumbents' lo-

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cations and, if so, in a way that supports the differentiation or agglomeration perspectives.

Theory Variables

During the founding process, hoteliers choose product attributes and a geographic location for their new hotel. Sometimes, the hotelier has a specific product in mind and seeks a suitable geographic location. Other times, the hotelier has a geographic location in mind and develops a product for it. In either case, our hypotheses predict how patterns of competitor location affect the pattern of founding location, where location is defined in both product and geographic terms. Thus, in our analysis, past foundings generate the spatial structure that creates and constrains opportunities for future foundings (Blau, 1994: 173–207).

The outcomes in our analysis are threefold: geographic, size, and price distance to established hotels. *Geographic distance* measures a newly founded hotel's similarity to established hotels in geographic space, using hotels' positions within the Manhattan street-avenue grid. For hotels in Lower Manhattan, where streets are laid out irregularly, we assigned comparable street and avenue locations by extrapolating from this grid. We divided street numbers by four to equalize the actual distances between streets (about 1/20th of a mile) and avenues (about 1/5th of a mile) in Manhattan.⁵ Geographic location differences between a newly founded hotel and its neighbors were converted to a Euclidean distance as follows:

$$\text{Geographic distance} = \sqrt{\sum_{j \neq i} [(A_j - A_i)^2 + (S_j - S_i)^2]}, \quad (1)$$

where A_i is the avenue location of a focal hotel i , S_i is its street location, and A_j and S_j are the avenue and street locations of neighboring hotels. Because the number of neighboring hotels new entrants consider as they choose their locations is not known, we computed and analyzed values for *geographic distance* based on the 5, 10, and 15 hotels geographically nearest the founding. This is consistent with patterns of geographically localized competition in the Manhattan hotel industry (Baum and Mezias, 1992), with Manhattan hotel managers' own categorizations of competitors (Lant and Baum, 1995), and with a competitor analysis for a major Manhattan hotel (Lewis, 1989). More generally, our approach is also compatible with studies across a range of industries showing that regardless of the number of firms in an industry, organizational decision makers develop simple cognitive categorizations of competitors and focus their attention on narrow sets of rival firms (Gripsrud and Gronhaug, 1985; Walton, 1986; Reger, 1990; Reger and Huff, 1993; Porac and Thomas, 1994).

Size distance and *price distance* measure a new hotel's similarity to established hotels in product space. These variables were also based on Euclidean distances. Hotel size was measured each year as the number of rooms operated, the standard measure of size in the hotel industry (Wyckoff and Sasser, 1981); hotel price was measured each year as the average advertised daily room rate in constant dollars. Both variables were constructed using data from the archival

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An exception to the 1/5th of a mile distance between avenues occurs from 3rd to 5th avenues, where in the 2/5ths of a mile between them, Lexington, Park, and Madison avenues all fall. To account for the close proximities of these avenues to each other, we coded hotels located on Lexington, Park, and Madison avenues as 3.5, 4, and 4.5, respectively, on our avenue measure. All these distances were confirmed in field research conducted for us by Marshall Meyer who calibrated these distances both by foot and by car.

sources described above. For a few years in which size or price data were missing for a hotel, we used linear interpolation to assign values for these variables. These measures compare the size and price of a newly founded hotel to those of neighboring hotels at the time of the focal hotel's founding, as follows:

$$\text{Size distance} = \sqrt{\sum_{j \neq i} (S_i - S_j)^2} \quad (2)$$

and

$$\text{Price distance} = \sqrt{\sum_{j \neq i} (P_i - P_j)^2}, \quad (3)$$

where S_i (or P_i) is the size (or price) of the newly founded hotel i at the time of its founding, and S_j (or P_j) are the sizes (or prices) of neighboring incumbent hotels, j . As for geographic distance, we computed and analyzed values for *size distance* and *price distance* based on the 5, 10, and 15 hotels physically closest to the newly founded focal hotel.

Our hypotheses predict a system of relationships among these three dimensions of hotel domains. Support for the differentiation perspective (hypothesis 1) requires symmetric negative relationships between the two product dimensions of hotel domains: holding geographic distance constant, the greater the size distance between a new hotel and its nearest competitors, the less the price distance; and the greater the price distance, the less the size distance. Support for hypothesis 1 also requires negative relationships in both directions between size and price distance, on the one hand, and geographic distance, on the other hand. The greater the size and price distance between a new hotel and its nearest competitors, the less the geographic distance. Similarly, the greater the geographic distance between a new hotel and its nearest competitors, the less the size and price distance. In contrast, support for the agglomeration perspective (hypothesis 2) requires positive relationships among all three variables. The greater the size and price distance between a start-up and its nearest established competitors, the greater the geographic distance; and the greater the geographic distance, the greater the size and price distance.

Support for hypotheses 1 and 2 would imply that hotels do not trade off between the two product dimensions (size and price). But if hotels do trade off between these two product dimensions, choosing to be similar to neighboring incumbents in terms of one product attribute (size or price) but different in terms of the other, then support for the tradeoff hypothesis (hypothesis 3) requires mixed relationships between price and size distance, on the one hand, and geographic distance, on the other: one set of relationships will be positive, the other set negative. Support for the tradeoff hypothesis also requires symmetric negative relationships between the two product dimensions of hotel domains: holding geographic distance constant, the greater the size distance between a new hotel and its nearest competitors, the less the price distance; and the greater the price distance, the less the size distance.

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Control Variables

Many other factors can influence size, price, and geographic location choice. Accordingly, our analyses control for a variety of hotel-, location-, and industry-specific factors. We assume that these factors, with the exception of focal hotel characteristics, are exogenous to decisions about location in geographic and product space.

Hotel characteristics. Our analyses of product and geographic location decisions control for the size and price location of hotel i , which are defined above. New hotels that are large will compete over a broader domain than new entrants that are small (Winter, 1990; Baum and Mezias, 1992). Hence, large entrants will locate far away from established firms. In contrast, new hotels that offer high-priced services will compete less with their neighbors than new hotels that offer low-priced services and so will locate closer to established firms. Our analyses also include the street and avenue location of hotel i , so as to control for possible economies of geography that result from proximity to activities from which the need or demand for a firm's services are derived. Business activity, points of tourist interest (e.g., Broadway, Central Park, Times Square), and travel (e.g., Grand Central Station, Penn Station, the Port Authority) are all located in the center of Manhattan. Consequently, demand for transient hotel services may be strongest there, which could lead to spatial concentration of hotels. To control for this possibility, we included both linear and squared terms for newly founded hotels' street and avenue positions. If economies of geography are stronger in the center of Manhattan, U-shaped relationships will be observed between the street and avenue positions of newly founded hotels and their geographic location distance from neighboring hotels, implying that hotels locate more closely to each other in the center of Manhattan, where demand is densest.

Environmental characteristics. We also controlled for several factors influencing the carrying capacity for transient-hotel services in Manhattan. We measured demand for hotel services as the number of *visitors to New York City* (divided by 1,000,000) in the prior year. This variable includes arrivals by sea, rail, and air. Because the hotel industry is vulnerable to the state of the economy (Wyckoff and Sasser, 1981), we controlled for the annual *gross national product (GNP) growth rate*. These two variables were constructed using information contained in the *Historical Statistics of the United States, Colonial Times to 1970* (U.S. Department of Commerce, Bureau of the Census, 1975), *Historical Abstracts of the United States* (U.S. Department of Commerce, Bureau of the Census, 1970–1990), and *Port of New York and New Jersey Authority* annual reports (1930–1990).

Differences in profit and demand conditions at different locations may also influence hoteliers' location decisions, which we address in part with the quadratic specifications of newly founded hotels' street and avenue locations. But we can use also the frequencies of hotel foundings and failures at particular locations as signals of the attractiveness of those locations (Delacroix and Carroll, 1983). In Delacroix and Carroll's rate-dependence model, foundings and failures are

both argued to exert nonmonotonic influences on subsequent foundings. Foundings initially signal a fertile niche to potential entrepreneurs, encouraging foundings. As foundings increase further, competition for resources increases, discouraging foundings. Similarly, at first, failures release resources that can be reassembled into new foundings. But many failures signal a hostile environment, discouraging foundings. Applied to the product and geographic location decisions of founders, Delacroix and Carroll's reasoning suggests that past foundings and failures may initially draw foundings close to incumbents, but as numbers of foundings and failures rise, they may push new entrants away from incumbents. To capture these effects locally, we computed *local foundings* for each founding, defined as the number of hotels among the newly founded hotel's nearest 5, 10, and 15 neighboring hotels that were founded in the prior year, and *local failures*, defined as the number of hotels that were not among the newly founded hotel's nearest 5, 10, and 15 neighboring hotels because they failed in the prior year but would have been if the focal founding had been in the prior year. To permit the expected curvilinear effects, we included both linear and squared terms for these variables.⁶

Manhattan is a fixed geographic area, so congestion and demand for space increase with human population density, and the city's real estate becomes differentiated (i.e., specialized residential, commercial, and industrial neighborhoods arise), which segregate hotels to particular locations. So we controlled for *human population* (divided by 1,000,000) in the year prior to founding.

To rule out an industry-specific crowding effect, we controlled for the *hotel density* of Manhattan, measured as the number of hotels operating the prior year.⁷ Manhattan hotel density is also a likely source of serial autocorrelation. A pure differentiation process implies negative serial correlation: firms that are similar in product offerings will first take advantage of opportunities to locate far away from each other; over time, as density rises, hotels that are similar in product offerings will be forced to locate progressively closer to each other. A pure agglomeration process implies exactly the opposite: the first set of similar hotels will locate side by side; later entrants will be forced to locate progressively further away from incumbents. Including hotel density in our models was one of the steps we took to reduce serial correlation in the error term.

Lastly, to rule out the possibility that effects of the distance variables were simply a result of the passage of time, our analyses included a time-trend variable, *calendar time*, defined as the number of years since our observation period began.

Model Specification and Estimation

The structure of our data is similar to the structure of data used in what economists call event studies (e.g., Brown and Warner, 1985; Whinston and Collins, 1992). Our data do not comprise a time series, since they are not observations at different points in time on the same social system or social actor but pool observations on many different social actors—here, many different newly founded hotels. These hotels are

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In a preliminary analysis we found no curvilinear effects for local failures. Therefore, we report only linear local failure effects below.

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We tested for curvilinear effects by including both population density and its square in a preliminary analysis. Because we found no evidence of such effects, we report only linear population density effects below.

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founded sporadically over time, which complicates estimation.

Our outcome variables are continuous, so we used multiple regression to test our hypotheses. Because size, price, and geographic differentiation are endogenous to the model (i.e., price, size, and geographic location constitute a system of decisions made by hotel founders that are simultaneous and interdependent), we analyzed a nonhierarchical system of equations:

$$\text{Geographic distance}_i = \alpha_1 + \beta_{21} \text{Price distance}_i + \beta_{31} \text{Size distance}_i + \gamma_1 \mathbf{X} + \varepsilon_1,$$

$$\text{Price distance}_i = \alpha_2 + \beta_{12} \text{Geographic distance}_i + \beta_{32} \text{Size distance}_i + \gamma_2 \mathbf{X} + \varepsilon_2,$$

$$\text{Size distance}_i = \alpha_3 + \beta_{13} \text{Geographic distance}_i + \beta_{23} \text{Price distance}_i + \gamma_3 \mathbf{X} + \varepsilon_3,$$

where $\{\beta\}$ is the set of direct effects of the endogenous theoretical variables on each other, \mathbf{X} is a vector of exogenous control variables described above, and $\{\varepsilon\}$ is the set of error terms.

Because the error terms in these equations are unlikely to be independent of the endogenous variables, ordinary least squares (OLS) estimation will yield biased and inconsistent estimates of the structural parameters (Hanushek and Jackson, 1977: 217–281; Greene, 1990: 591–659). Moreover, OLS estimation on the entire system of equations is inefficient compared to an estimator that makes use of the cross-equation correlations of the disturbances (Greene, 1990: 632; Kennedy, 1992: 161). We used two available solutions to this estimation problem: three-stage least-squares (3SLS) and generalized method of moments (GMM) estimation.

3SLS estimation (Greene, 1990: 631–634; Kennedy, 1992: 161–162; SAS Institute, 1993: 554) is the systems equivalent of two-stage least squares (2SLS) estimation. Because it incorporates information on cross-equation disturbances, 3SLS estimation is asymptotically more efficient than 2SLS estimation. The 3SLS procedure operates as follows: (1) Each endogenous variable in the system (here, size distance, price distance, and geographic distance) is regressed on all of the exogenous variables, and predicted values of the endogenous variables are calculated. (2) These predicted values are used as instrumental variables for the endogenous variables in OLS regressions. Estimates of error terms are obtained from these regressions, and their variance-covariance matrix is calculated. (3) Using the cross-equation disturbance correlation estimates, generalized least squares estimation is applied to a single large equation representing all the equations in the system.

GMM works by estimating sample statistics of the system parameters that have the same property in the sample as population parameters have in the population (Greene, 1990: 114–115; Kennedy, 1992: 32–33; SAS Institute, 1993: 555–557; Hamilton, 1994: 409–434). This technique is called method of moments because it relies on the fact that a moment in a population distribution can be estimated using the corresponding moment of a sample (e.g., the mean, variance, or skewness of a system parameter). The advantage

of GMM is that it requires specification of only certain moment conditions for the parameters to be estimated, rather than the full distribution function (Hamilton, 1994: 409). Many other estimation methods are special cases of GMM, e.g., OLS is a special case in which the regression residuals are uncorrelated with the explanatory variables and the system is just identified. The specific advantage of GMM over 3SLS is that GMM can correct for heteroskedasticity when an appropriate weighting scheme for generalized least-squares estimation cannot be determined (SAS Institute, 1993: 510) and that it yields the White estimator for heteroskedastic disturbances.

Although our analyses included hotel density to account for one important source of autocorrelation, our analyses could conceivably suffer from correlation of error terms between all observations in one year and all observations in the previous year, if our models omitted important predictors of founding location and product characteristics. The error terms for observations at any point in time might also be cross-sectionally correlated. If autocorrelation exists, point estimates of model parameters will be unbiased and consistent but not efficient, and their standard errors will be biased either upward or downward, but in which direction is impossible to tell a priori. Because our data structure did not permit us to deal with autocorrelation in the traditional manner, using the autocorrelation coefficient r , which expresses the correlation among observations, we employed autoregressive moving average techniques. The SAS procedure MODEL (SAS Institute, 1993: 509–683) can test and correct for serial and cross-sectional autocorrelation in data such as ours, for the complete system of equations (Donna Woodward, personal communication, July 1995). Preliminary analysis confirmed that models with a first-order moving average process, MA(1), were appropriate.

RESULTS

Table 1 presents descriptive statistics and correlations for all study variables. Although correlations between several of the control variables (e.g., hotel density, human population, calendar time) and independent and control variables (e.g., size and size distance; price and price distance) are moderate to high (up to .82, between calendar time and visitors to New York City), multicollinearity will not bias point estimates, although it may inflate standard errors for the collinear variables (Kennedy, 1992). Geographic, size-, and price-distance variables computed for the focal hotel's 5, 10, and 15 nearest neighbors are highly correlated. Because these variables are analyzed separately, this multicollinearity will not affect our results.

Tables 2, 3, and 4 report 3SLS-MA(1) and GMM-MA(1) estimates for our analysis of spatial and product location behavior in the Manhattan hotel industry, in which the dependent variables are Euclidean distances between newly founded hotels and, respectively, the 5, 10, and 15 geographically nearest established hotels in terms of geography, price, and size. In each table, equations 1a and 1b estimate newly founded Manhattan hotels' geographic location behavior; equations 2a and 2b, price location behavior; and equations

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Table 1

Means, Standard Deviations, Minimums, Maximums, and Pearson Correlations for the Study Variables*

Variable	Mean	S.D.	Min.	Max.	1	2	3	4
1. Geographic distance hotel <i>i</i> (5)	3.77	4.26	.00	36.99	-	-		
2. Geographic distance hotel <i>i</i> (10)	11.04	10.66	.75	68.84	.958	-		
3. Geographic distance hotel <i>i</i> (15)	20.51	18.08	2.00	121.39	.918	.985	-	
4. Size hotel <i>i</i>	342.05	341.61	10.00	2500.0	-.056	-.065	-.069	-
5. Price hotel <i>i</i>	6.60	5.61	.70	43.50	.011	.008	-.010	.206
6. Street hotel <i>i</i>	52.51	23.19	-15.00	126.00	.235	.319	.364	-.025
7. Avenue hotel <i>i</i>	6.50	2.32	.00	12.00	-.030	.017	.057	-.005
8. NYC human population/1,000,000	5.91	1.35	3.18	7.89	-.062	-.088	-.120	.157
9. Manhattan hotel density	238.90	76.76	132.00	353.00	-.044	-.063	-.083	.052
10. Calendar time	27.53	19.94	.00	92.00	-.032	-.049	-.083	.171
11. Visitors to NYC/1,000,000	43.11	15.43	14.73	91.72	-.080	-.098	-.125	.162
12. GNP growth	2.19	6.73	-14.80	16.60	.028	.023	.035	.009
13. Price distance hotel <i>i</i> (5)	15.25	15.10	1.30	138.60	.052	.056	.049	.155
14. Price distance hotel <i>i</i> (10)	30.99	29.57	3.90	310.20	.043	.047	.037	.158
15. Price distance hotel <i>i</i> (15)	47.03	42.74	3.90	459.60	.044	.047	.036	.153
16. Size distance hotel <i>#</i> 100 (5)	13.24	13.58	.00	94.28	-.068	-.086	-.096	.711
17. Size distance hotel <i>#</i> 100 (10)	26.58	25.76	2.25	201.60	-.054	-.076	-.090	.745
18. Size distance hotel <i>#</i> 100 (15)	40.12	38.16	2.60	295.77	-.056	-.076	-.090	.765
19. Local foundings <i>i</i> (5)	1.19	1.92	.00	13.00	-.246	-.260	-.264	.044
20. Local foundings <i>i</i> (10)	1.76	2.58	.00	18.00	-.235	-.260	-.268	.057
21. Local foundings <i>i</i> (15)	2.61	3.76	.00	27.00	-.215	-.246	-.257	.065
22. Local failures <i>i</i> (5)	.31	.77	.00	5.00	-.113	-.131	-.141	-.023
23. Local failures <i>i</i> (10)	.43	.84	.00	5.00	-.111	-.142	-.160	.009
24. Local failures <i>i</i> (15)	.60	1.04	.00	6.00	-.099	-.141	-.166	.043

Variable	5	6	7	8	9	10	11	12
5. Price hotel <i>i</i>	-							
6. Street hotel <i>i</i>	-.030	-						
7. Avenue hotel <i>i</i>	-.128	.502	-					
8. NYC human population/1,000,000	.114	.112	.008	-				
9. Manhattan hotel density	-.198	.141	.037	.701	-			
10. Calendar time	.505	.004	-.063	.713	.414	-		
11. Visitors to NYC/1,000,000	.437	.075	-.008	.734	.492	.818	-	
12. GNP growth	.026	-.083	-.016	-.340	-.422	-.170	-.278	-
13. Price distance hotel <i>i</i> (5)	.686	-.036	-.070	-.056	-.232	.248	.211	.002
14. Price distance hotel <i>i</i> (10)	.703	-.055	-.082	-.059	-.240	.256	.215	.028
15. Price distance hotel <i>i</i> (15)	.720	-.059	-.092	-.062	-.246	.259	.212	.025
16. Size distance hotel <i>#</i> 100 (5)	.100	-.121	-.077	.236	.120	.228	.200	-.039
17. Size distance hotel <i>#</i> 100 (10)	.143	-.100	-.063	.283	.150	.281	.261	-.043
18. Size distance hotel <i>#</i> 100 (15)	.157	-.102	-.073	.282	.153	.281	.263	-.057
19. Local foundings <i>i</i> (5)	-.091	-.022	.063	-.060	.077	-.132	-.156	.050
20. Local foundings <i>i</i> (10)	-.096	-.011	.044	-.043	.113	-.140	-.008	.047
21. Local foundings <i>i</i> (15)	-.094	-.002	.027	-.028	.135	-.139	-.001	.043
22. Local failures <i>i</i> (5)	.008	-.114	-.043	-.146	-.114	-.062	-.077	-.046
23. Local failures <i>i</i> (10)	.038	-.160	-.081	-.132	-.101	-.036	-.065	-.077
24. Local failures <i>i</i> (15)	.068	-.195	-.115	-.104	.076	-.004	-.044	-.104

Variable	13	14	15	16	17	18	19	20
13. Price distance hotel <i>i</i> (5)	-							
14. Price distance hotel <i>i</i> (10)	.949	-						
15. Price distance hotel <i>i</i> (15)	.939	.985	-					
16. Size distance hotel <i>#</i> 100 (5)	.065	.071	.062	-				
17. Size distance hotel <i>#</i> 100 (10)	.092	.101	.099	.950	-			
18. Size distance hotel <i>#</i> 100 (15)	.106	.109	.107	.931	.979	-		
19. Local foundings <i>i</i> (5)	-.066	-.052	-.066	-.007	-.010	-.005	-	
20. Local foundings <i>i</i> (10)	-.078	-.071	-.082	-.005	-.000	.007	.960	-
21. Local foundings <i>i</i> (15)	-.082	-.081	-.090	-.003	.008	.017	.878	.976
22. Local failures <i>i</i> (5)	.015	.033	.031	-.063	-.071	-.057	.196	.175
23. Local failures <i>i</i> (10)	.021	.039	.038	-.034	-.033	-.017	.197	.188
24. Local failures <i>i</i> (15)	.026	.042	.043	.002	.012	.030	.179	.184

Table 1 (Continued)

Variable	21	22	23
21. Local foundings i (15)	-		
22. Local failures i (5)	.150	-	
23. Local failures i (10)	.171	.960	-
24. Local failures i (15)	.179	.825	.950

* Coefficients $>.090$ are significant at $p < .05$. The sample contained 481 founding observations; (5), (10), and (15) indicate the number of neighboring hotels used to compute the distance and local founding and failure variables.

3a and 3b, size location behavior. In all cases, 3SLS and GMM estimation yield very similar results: coefficient estimates are always in the same direction and at similar levels of significance. GMM estimation proved to be slightly more efficient, generally yielding larger coefficients and smaller standard errors. All tables show similar results: parameter estimates are in the same direction and generally at similar levels of significance. Given these similarities, we focus on the estimates reported in Table 4, because the dependent and independent variables based on the 15 geographically nearest neighbors are more robust than those based on 5 or 10 neighbors.

Table 2

Models of Distance at Founding to Five Nearest Neighbors, 1898–1990*

Variable	Geographic Distance		Price Distance		Size Distance	
	1a 3SLS	1b GMM	2a 3SLS	2b GMM	3a 3SLS	3b GMM
Constant	32.172* (4.663)	32.995* (5.217)	-64.694* (15.619)	-72.076* (12.520)	37.193* (11.051)	38.491* (9.659)
Size hotel i	.022* (.005)	.032* (.005)	-.051* (.014)	-.070* (.013)	.043* (.008)	.046* (.009)
Price hotel i	-1.476* (.327)	-1.941* (.263)	3.792* (.611)	4.429* (.584)	-2.144* (.662)	-2.509* (.557)
Street hotel i	-.165* (.036)	-.130* (.047)	.309* (.122)	.270* (.108)	-.572* (.184)	-.519* (.168)
(Street hotel i) ² /100	.196* (.031)	.159* (.040)	-.377* (.118)	-.338* (.093)	.650* (.184)	.581* (.164)
Avenue hotel i	-3.091* (.563)	-2.479* (.719)	6.945* (1.627)	5.643* (1.706)	-7.155* (1.341)	-6.532* (1.220)
(Avenue hotel i) ²	.178* (.040)	.127* (.051)	-.406* (.114)	-.292* (.118)	.394* (.089)	.314* (.080)
Visitors to NYC/1,000,000	-.014 (.047)	.048 (.052)	-.049 (.128)	-.116 (.126)	-.229* (.085)	-.256* (.084)
GNP growth	-.073* (.039)	-.124* (.045)	.132 (.109)	.173 (.107)	-.132* (.069)	-.170* (.071)
NYC human population	-3.609* (1.121)	-4.082* (1.275)	4.695 (3.143)	4.989 (3.081)	-4.839* (2.122)	-4.880* (2.037)
Manhattan hotel density	.004 (.007)	-.002 (.008)	-.009 (.019)	.004 (.020)	.000 (.013)	-.007 (.013)
Calendar time	.279* (.073)	.342* (.083)	-.597* (.204)	-.749* (.201)	.488* (.122)	.472* (.127)
Local foundings	-1.585* (.329)	-1.664* (.403)	3.614* (.886)	3.724* (1.021)	-1.604* (.716)	-1.769* (.642)
(Local foundings) ²	.141* (.033)	.146* (.037)	-.332* (.085)	-.330* (.092)	.133* (.070)	.152* (.062)
Local failures	-.014 (.334)	-.443 (.421)	.272 (.911)	.831 (1.032)	-.873 (.568)	-.956 (.608)

* $p < .05$.

* Standard errors are in parentheses. All estimates are based on a model including a first-order moving average, MA(1), process. The sample included 481 hotel foundings. The geographic, size-, and price-distance and local founding and failure variables are computed based on the five nearest neighbors to the newly founded hotel.

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Figure 3 summarizes the system of structural relationships, based on coefficients reported in Table 4. In the figure, following standard visual notation, a line with an arrowhead indicates a significant positive effect. A line with a circle head (i.e., a small circle enclosing a dash) indicates a significant negative effect. The mix of positive and negative coefficients characterizing relationships among the variables in the system indicates that neither pure differentiation (hypothesis 1) nor pure agglomeration (hypothesis 2) can account entirely for the geographic and product location decisions of Manhattan hotel founders. Instead, these two forces influence founding location decisions jointly and in a manner largely consistent with the prediction that differentiation and agglomeration are traded off in multidimensional product domains (hypothesis 3). All estimated relationships are consistent with hypothesis 3 except the positive effect of price distance on size distance. Below, we examine in detail how differentiation and agglomeration influence each location decision variable separately and then interpret the complete system of relationships and the tradeoffs they imply.

Table 3

Models of Distance at Founding to Ten Nearest Neighbors, 1898–1990*

Variable Equation Estimation Method	Geographic Distance		Price Distance		Size Distance	
	1a 3SLS	1b GMM	2a 3SLS	2b GMM	3a 3SLS	3b GMM
Constant	73.300* (8.874)	70.767* (10.314)	-32.141 (39.491)	-50.368* (28.803)	99.942* (18.942)	102.139* (17.513)
Size hotel <i>i</i>	.043* (.011)	.062* (.013)	-.064* (.030)	-.071* (.026)	.075* (.017)	.094* (.021)
Price hotel <i>i</i>	-1.734* (.850)	-2.453* (1.018)	5.591* (1.278)	5.746* (1.041)	-2.830* (1.388)	-3.436* (1.670)
Street hotel <i>i</i>	-.495* (.070)	-.423* (.096)	1.084* (.327)	1.276* (.226)	-.544* (.164)	-.554* (.146)
(Street hotel <i>i</i>) ² /100	.586* (.059)	.536* (.082)	-1.179* (.347)	-1.411* (.234)	.654* (.167)	.710* (.129)
Avenue hotel <i>i</i>	-4.342* (1.255)	-4.512* (1.569)	6.639* (3.464)	6.821* (2.919)	-4.928* (2.297)	-6.198* (2.539)
(Avenue hotel <i>i</i>) ²	.221* (.086)	.223* (.111)	-.402* (.232)	-.387* (.190)	.222* (.152)	.296* (.174)
Visitors to NYC/1,000,000	.020 (.097)	.069 (.107)	-.133 (.272)	-.328 (.198)	.079 (.161)	.100 (.174)
GNP growth	-.200* (.075)	-.213* (.081)	.117 (.226)	.221 (.162)	-.291* (.127)	-.318* (.131)
NYC human population	-7.892* (2.271)	-8.988* (2.579)	6.231 (6.940)	8.666 (5.675)	-11.788* (3.835)	-13.008* (4.120)
Manhattan hotel density	.010 (.014)	.019 (.016)	-.016 (.041)	.010 (.035)	.014 (.024)	-.027 (.027)
Calendar time	.618* (.136)	.626* (.155)	-.928* (.443)	-.447* (.371)	.995* (.214)	.949* (.239)
Local foundings	-1.709* (.593)	-2.289* (.668)	2.855* (1.518)	3.538* (1.337)	-2.327* (1.022)	-3.146* (1.105)
(Local foundings) ²	.093* (.042)	.125* (.048)	-.196* (.102)	-.228* (.079)	.121* (.071)	.168* (.080)
Local failures	-.610 (.575)	-.857 (.637)	-.722 (1.655)	-.237 (1.162)	-1.020 (.924)	-1.305 (.991)

* $p < .05$.

* Standard errors are in parentheses. All estimates are based on a model including a first-order moving average, MA(1), process. The sample included 481 hotel foundings. The geographic, size-, and price-distance and local founding and failure variables are computed based on the ten nearest neighbors to the newly founded hotel.

Table 4

Models of Distance at Founding to Fifteen Nearest Neighbors, 1898–1990*

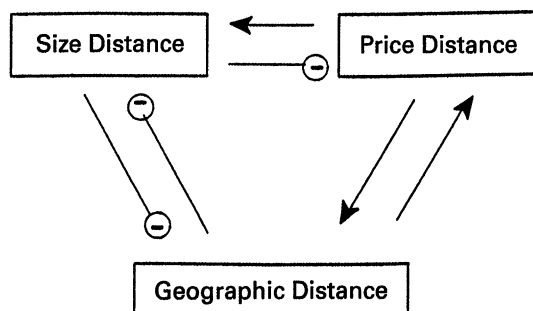
Variable Equation Estimation Method	Geographic Distance		Price Distance		Size Distance	
	1a 3SLS	1b GMM	2a 3SLS	2b GMM	3a 3SLS	3b GMM
Constant	127.833* (15.672)	119.019* (20.120)	-153.650* (51.754)	-174.051* (35.266)	164.118* (27.639)	159.646* (27.516)
Size hotel <i>i</i>	.108* (.019)	.123* (.020)	-.171* (.040)	-.187* (.033)	.153* (.021)	.168* (.028)
Price hotel <i>i</i>	-5.301* (1.378)	-6.401* (1.153)	10.578* (1.560)	10.493* (1.497)	-7.460* (1.871)	-8.756* (1.577)
Street hotel <i>i</i>	-.955* (.122)	-.942* (.167)	1.043* (.448)	1.349* (.288)	-1.157* (.245)	-1.242* (.228)
(Street hotel <i>i</i>) ² /100	1.156* (.103)	1.160* (.137)	-1.325* (.482)	-1.683* (.257)	1.410* (.251)	1.536* (.190)
Avenue hotel <i>i</i>	-8.958* (2.072)	-9.483* (2.612)	13.998* (4.341)	14.766* (4.290)	-11.375* (3.171)	-12.874* (3.590)
(Avenue hotel <i>i</i>) ²	.465* (.143)	.484* (.180)	-.757* (.291)	-.759* (.285)	.578* (.214)	.656* (.245)
Visitors to NYC/1,000,000	.094 (.174)	.197 (.209)	-.228 (.352)	-.333 (.339)	.160 (.243)	.280 (.287)
GNP growth	-.370* (.136)	-.349* (.171)	.436 (.300)	.520* (.278)	-.495* (.193)	-.471* (.236)
NYC human population	-15.004* (3.996)	-14.380* (5.074)	20.113* (9.015)	21.178* (8.470)	-20.011* (5.715)	-19.359* (6.935)
Manhattan hotel density	.022 (.026)	.018 (.033)	-.027 (.054)	-.021 (.056)	.030 (.037)	.023 (.045)
Calendar time	1.161* (.235)	1.088* (.284)	-1.637* (.548)	-1.659* (.463)	1.587* (.321)	1.476* (.385)
Local foundings	-1.836* (.608)	-1.853* (.810)	2.662* (1.290)	2.754* (1.355)	-2.431* (.871)	-2.471* (.910)
(Local foundings) ²	.070* (.030)	.069* (.038)	-.109* (.061)	-.106* (.061)	.093* (.042)	.092* (.046)
Local failures	-.989 (.804)	-1.285 (1.081)	.711 (1.659)	1.673 (1.722)	-1.322 (1.131)	-1.689 (1.252)

* $p < .05$.

* Standard errors are in parentheses. All estimates are based on a model including a first-order moving average, MA(1), process. The sample included 481 hotel foundings. The geographic, size-, and price-distance and local founding and failure variables are computed based on the fifteen nearest neighbors to the newly founded hotel.

Geographic Distance

The influence of price and size distance on geographic distance are shown in equations 1a and 2a. The positive coefficient for price distance indicates that the more dissimilar the price of a newly founded hotel is to neighboring incumbent hotels, the farther it locates from them. Alternatively, the more similar the price of a newly founded hotel is to neigh-

**Figure 3. Summary of findings.**

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boring incumbents, the closer it locates to them. In contrast, the negative coefficient for size distance means that the more similar the size of a new hotel to that of its neighboring incumbents, the farther it locates from them. Together, these coefficients suggest that agglomeration and differentiation processes operate simultaneously but on different organizational product attributes: new entrants tend to establish themselves physically close to similarly priced hotels but far away from similarly sized hotels. Or, conversely, new entrants tend to establish themselves physically close to differently sized hotels but far from differently priced hotels. Thus, Manhattan hotels locate sufficiently close to neighboring hotels on one product dimension (price) to benefit from agglomeration economies, but they differentiate on the other dimension (size) to avoid direct competition and create potential complementary differences.

Price Distance

Equations 2a and 2b give estimates for the impact of geographic and size distance on price distance. The coefficient for geographic distance is positive, which indicates, *ceteris paribus*, that the closer a newly founded hotel is situated to neighboring incumbent hotels, the more similar its price is to theirs. This result reciprocates the positive effect of price distance on geographic distance in equations 1a and 1b. Thus, the agglomerative tendencies of Manhattan hotels with respect to geographic and product price dimensions are mutually reinforcing, so that the closer a new entrant locates to incumbent hotels the more similar its price is to incumbents' prices, and vice versa. The coefficient for size distance is negative. Thus, the more similar to neighboring incumbents a new hotel is in terms of size, the greater the gap it creates between its price and prices charged by incumbents. This suggests that size-localized competition among hotels leads new entrants to differentiate themselves in terms of price from their similarly sized competitors. In determining price distance, as in determining geographic distance, agglomeration and differentiation processes appear to operate simultaneously.

Size Distance

Equations 3a and 3b report our analysis of the impact of geographic distance and price and distance on size distance. The coefficient for geographic distance is negative, which indicates, *ceteris paribus*, that the closer the location of a newly founded hotel is to neighboring incumbent hotels, the more dissimilar its size is to theirs. This result matches the negative effect of size distance on geographic distance in equations 1a and 1b. Thus, differentiation tendencies of Manhattan hotels on geographic and product size dimensions are mutually reinforcing—the closer a new entrant locates to neighboring incumbent hotels the more different its size is to their sizes, and vice versa. The coefficient for price distance is positive; hence, the more similar the price of a new hotel is to that of neighboring incumbents, the more similar its size is to theirs. This effect runs opposite to the effect of size distance on price distance in equations 2a and 2b. Taken together, these estimates indicate that the more similar a new entrant's price is to neighboring incumbent

hotels, the more similar its size will be to incumbents' sizes, but the more similar a new entrant's size is to neighboring incumbent hotels, the greater the gap will be between its product price and incumbents' prices. This asymmetry exposes the tension between differentiation and agglomeration of hotels in terms of product size and price—new entrants to the Manhattan hotel industry trade off between price and size product dimensions, balancing similarity to nearby hotels on one product dimension with dissimilarity on the other, being pulled closer by similarity on one product dimension only to be pushed apart by similarity on the other. Thus, agglomeration and differentiation processes operate simultaneously in determining size distance.

Magnitudes of Effects

We were interested in the absolute and relative magnitudes of the relationships among variables in the system. Table 5 presents predicted magnitudes of changes in the distance of a newly founded hotel from its 15 nearest neighbors on each organizational domain dimension as a function of one standard deviation (for comparability) increases in distances on the other two dimensions. To make the implications of these magnitudes more concrete, we also give in Table 5 implied mean geographic, price, and size distances of a newly founded hotel from its 15 nearest neighbors. In the table, negative effects signify a tendency to differentiate and positive effects indicate a tendency to cluster.

The first column in Table 5 gives predicted magnitudes of changes in the geographic distance of a newly founded hotel from its 15 nearest neighbors (based on Table 4, equation 1b) as a function of one-standard-deviation increases in price and size distances. As the table shows, a one-standard-deviation increase in the price-agglomeration pull toward similarly priced neighboring hotels has about the same effect on geographic distance as a one-standard-deviation increase in the size-localized-competition push away from similarly sized neighboring hotels, and these effects are large: one-standard-deviation increases in price distance and size distance both result in more than one-standard-deviation changes in geographic distance. In more concrete terms, increasing average price distance from neighboring hotels by \$2.85 (in

Table 5

Estimated Effect Sizes for the Distance Variables*

Variable	Value of one S. D. increase	Geographic distance i		Price distance i		Size distance $i/100$	
		β	Effect size	β	Effect size	β	Effect size
Geographic distance i	18.08 (1.21)	–		1.460	26.40 (1.76)	–1.334	–24.12 (–1.61)
Price distance i	42.74 (2.85)	.581	24.83 (1.66)	–		.797	34.06 (2.27)
Size distance $i/100$	38.16 (2.54)	–.726	–27.70 (–1.85)	–1.095	–41.79 (–2.79)	–	

* β s are from GMM-MA(1) equations for geographic, price, and size distance in Table 4. Standard deviations are for distances based on 15 nearest neighbors (see Table 1). Mean change in geographic, price, and size distances from the 15 nearest neighbors are given in parentheses.

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constant terms) increases the average geographic distance by 1.66 blocks (.33 miles), while increasing average size distance from neighboring hotels by 254 rooms decreases the average geographic distance by 1.85 blocks (.37 miles). Blocks here are in "as-the-crow-flies" units, since the geographic distance variable combines street and avenue location information (see equation 1). Each "block" is approximately $\frac{1}{5}$ th of a mile in length. Although the mean constant-dollar changes appear small, they are in fact quite large relative to the mean constant-dollar price of a Manhattan hotel room, which is \$6.60, with a standard deviation of \$5.61 (see Table 1).

The second column gives predicted magnitudes of changes in the price distance of a newly founded hotel from its 15 nearest neighbors (based on Table 4, equation 2b) resulting from one-standard-deviation increases in price and size distances. The table indicates that the effect of a one-standard-deviation increase in the geographic-agglomeration pull toward similarly priced neighboring hotels on price distance is about one-half the strength of the effect of a one-standard-deviation increase in the size-localized-competition push away from similarly sized neighboring hotels. Again, these effects are substantial: one-standard-deviation increases in geographic distance and size distance result in one-half and one-standard-deviation changes in price distance, respectively. In more vivid terms, increasing average geographic distance from neighboring hotels by 1.21 blocks (.24 miles) increases the average price distance by \$1.76 (in constant terms), while increasing average size distance from neighboring hotels by 254 rooms decreases the average price distance by \$2.79 (in constant terms).

The final column in Table 5 shows predicted changes in the size distance of a newly founded hotel from its 15 nearest neighbors (based on Table 4, equation 3b) as a function of one-standard-deviation increases in geographic distance and price distance. The effect of a one-standard-deviation increase in the geographically localized competition push away from neighboring hotels on size distance is about three-fourths the strength of the effect of a one-standard-deviation increase in the price-agglomeration pull toward similarly priced neighboring hotels. These effects are also substantial: one-standard-deviation increases in geographic distance and price distance both result in more than one-half standard deviation changes in size distance. Or, more graphically, increasing average geographic distance from neighboring hotels by 1.21 blocks (.24 miles), decreases the average size distance by 161 rooms, while increasing average price distance from neighboring hotels by \$2.85 (in constant terms) increases the average size distance by 227 rooms. Overall, then, the effects of geographic distance are smallest in magnitude, and the larger effects of price distance and size distance are of about the same strength.

INTERPRETATION

Our analysis reveals the complexity of differentiation and agglomeration processes in a multidimensional space. Both differentiation and agglomeration strongly affect hoteliers' location decisions. Our findings provide evidence that local-

ized competition leads to differentiation among Manhattan hotels. The negative effects of size distance on both geographic and price distance suggest that size-localized competition prompts founders of Manhattan hotels to differentiate their new entries from neighboring incumbents in terms of both geographic location and price. And the negative effect of geographic distance on size distance indicates that geographically localized competition has a similar influence on the differentiation of new entrants in terms of size.

There is also evidence that agglomeration economies lead to concentration of hotel activity in geographic and product space. The positive effects of price distance on both geographic and size distance suggest that price-based agglomeration economies led founders of Manhattan hotels to cluster their new entries both in terms of geography and size. And the positive effect of geographic distance on price distance suggests that geography-based agglomeration economies led to clustering in terms of price. We see two primary sources of this clustering. The first source is information externalities: established hotels' success demonstrates to potential entrants the feasibility of production and strength of demand at a particular geographic location and price. New hotels locate so as to minimize the risks of enforced geographic and price relocation, encouraging imitation, and concentrated geographic and price location patterns result. The second source of clustering is the reduction of consumer search costs. Geographic clustering of hotels creates hotel districts, whose existence can increase demand for all members of the district by reducing consumer search costs and uncertainty about the appropriateness of the hotel's location (e.g., its proximity to points of tourist interest or business activity).⁸ Hotel districts composed of similarly priced hotels further reduce consumer search costs and uncertainty by increasing district definition (i.e., economy-class hotel district, luxury-class hotel district).

Our findings on size, however, indicate that Manhattan hotel founders perceive size-localized competition to be a serious threat to their new ventures, but they perceive economies of adjacent location with similarly priced hotels to outweigh any effects of price-localized competition with them. As a result, Manhattan hotel founders are willing to trade off differences in size for similarity in price. The tendency to cluster with respect to price but not with respect to size may be further stimulated by the potential for mutualistic interactions between neighboring hotels of differing sizes (e.g., a cluster of various sized hotels around a large conference center).

Control Variables

Hotel characteristics. The positive effect of a new hotel's size on geographic distance means that large hotels tend to locate farther from neighboring hotels than do small hotels. This is consistent with Baum and Mezias's (1992) finding that large hotels compete over a larger size range than small ones. The negative effect of size on price distance suggests that large hotels are more similar to their neighbors with respect to price than are small hotels, perhaps because large hotels are constrained to prices at which demand is dense

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While the formation of hotel districts may also produce some benefits of shared infrastructure, we think these are unlikely to influence location choices very strongly in a concentrated urban setting like Manhattan.

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enough to support their large-scale operations. The positive effect of size on size distance indicates that large hotels tend to be differentiated in size from their neighbors. This captures the skewed size distribution of Manhattan hotels—there are few large hotels to be similar to.

The negative effect of the price of a newly founded hotel on geographic distance indicates that new luxury hotels tend to locate closer to other hotels than do new midprice or economy hotels. This likely reflects the crowding of luxury hotels in desirable locations. The effect of price on price distance is also positive, indicating that luxury hotels tend to be differentiated in price from their nearest neighbors. Like the effect of a new entrant's size on its size distance, this reflects the skewed price distribution of Manhattan hotels—there are few luxury hotels to be similar to. The negative effect of price on size distance indicates that luxury hotels tend to be more similar in size than midprice or economy hotels. Thus, luxury hotels are constrained to sizes that are compatible with the type of personalized service they provide and the small size of the luxury-market segment.

The inverted U-shaped effects of street and avenue location on geographic distance mean that hotels founded in midtown Manhattan to take advantage of economies of geography locate closer to neighboring hotels. The greater the demand for hotel accommodations, the greater the degree of crowding new hotels are willing to face. The effects of geographic location on size distance are also inverted U-shaped. Hotels founded in midtown Manhattan are also similar in size to neighboring hotels. This may be due to greater demand and higher property costs narrowing the feasible size distribution. Finally, the U-shaped effects of street and avenue location indicate that new hotels founded in the center of Manhattan are most dissimilar with respect to price, relative to their nearest neighbors. This suggests that price differentiation is used to diffuse intense size- and geographically localized competition in the concentrated midtown Manhattan market.

Environmental characteristics. The effect of GNP growth on geographic distance is negative, indicating that new hotels tend to be founded closer together when the economy is booming, probably because good economic conditions are associated with strong demand for hotel services and lessened competitive pressures. The negative coefficient of GNP growth on size distance indicates that size differences also declined with economic prosperity, suggesting that environmental munificence blunts size-localized competition. By comparison, the significant positive effect of GNP growth on price distance indicates that strong economic performance stimulates new entrants to differentiate themselves from incumbents in terms of price. This may reflect a negative relationship between economic performance and consumer price sensitivity and, more generally, trends toward increasing socioeconomic stratification spurred by economic growth during our observation period.

The inverted U-shaped effects of local foundings on geographic and size distance support the idea that recent foundings at a particular geographic location initially signal a fertile

niche, encouraging new hotels to locate close to incumbents, but as foundings increase further, competition for resources pushes new entrants away from neighboring incumbents. The U-shaped effect of local foundings on price distance contradicts this idea, however, suggesting instead that price differentiation is used to ameliorate size- and geographically localized competition in attractive local niches.

Consistent with the idea that increases in human population density lead the city's real estate to become differentiated into specialized neighborhoods (e.g., distinct hotel districts), newly founded hotels tend to cluster more closely when human population density is higher. Price distances between newly founded hotels and their nearest neighbors increased with human population density, reflecting strategic differentiation in the wake of increased competition. In contrast, size distances between newly founded hotels and their nearest neighbors decreased with human population density.

The significant positive effect of the time trend on geographic distance indicates that geographic distance at founding increased over our observation period. This may reflect a decreasing dependence of hotels on locations proximate to Manhattan's train stations with the shift to air travel, as well as improvements in transportation services within Manhattan. The significant positive effect of the time trend on size distance indicates that size distance at founding increased over time. This may reflect the effect of improvements in construction techniques over time on the cost and feasibility of founding ever larger hotels. Lastly, the negative effect of the time trend on price distance indicates that price differences between newly founded hotels and incumbents tended to decrease over the observation period. This may have occurred as clearly delineated price tiers for economy, midprice, and luxury market segments became institutionalized over time.

CONCLUSION

This paper investigates key entrepreneurial decisions, namely, how closely new firms should locate in product and geographic space to other firms in their industry. Building on several literatures in sociology and economics, we proposed two opposing hypotheses: new firms will locate (1) far from similar established firms to minimize localized competition or (2) close to similar established firms to benefit from agglomeration economies. Our analysis of founding locations of Manhattan hotels partially supports both perspectives. New hotels tended to locate geographically close to established hotels that were similar in terms of price and different in terms of size. Hotel founders tended to act as if the benefits of agglomeration with hotels of similar price were greater than the costs of price-localized competition and the costs of size-localized competition were greater than the benefits of agglomeration with similarly sized hotels.

Because our study takes founding as a given and asks what kind of organization is founded and where, it complements more traditional ecological analyses of founding rates that ask when founding will occur, by any kind of organization within a population, in any location in that population's habi-

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tat. While organizational ecologists typically treat foundings as homogeneous, we treated each founding as distinct with respect to three important dimensions of organizational domain: geographic location, price, and size. This study therefore provides a richer understanding of the founding choice process and offers a first step toward systematizing our knowledge of that process. Our relational approach to the dynamics of location choice also overcomes serious operational problems of the positional approach to location choice from economics, making it possible to subject theoretical predictions from spatial economics to rigorous empirical testing.

Our results generally parallel those of Baum and Mezias's (1992) study of failure in the Manhattan hotel industry. Both founding and failure appear to be driven by two opposing processes: (1) direct competition pushes firms far apart from similar competitors and increases failure rates, while complementary differences pull firms close to dissimilar competitors and lower failure rates; and (2) spillovers from adjacent competitors (i.e., agglomeration economies) pull firms close to similar competitors and lower failure rates. Our results differ, however, in one respect from those of Baum and Mezias: while Manhattan hotels more similar to one another in terms of geographic location, size, and product price compete more intensely and therefore are more likely to die, founding location choices are sensitive to size-localized and geographic competition but not to price-localized competition. One implication of these divergent results is that while hoteliers tend to make location choices that enhance their survival chances by moderating geographic and size-localized competition, they also tend to make choices that require the benefits of geographic clustering with similarly priced hotels to outweigh the hazards of localized price competition. Future research could examine the survival implications of this tradeoff and the extent to which these findings generalize to the many other industries in which firms face uncertain demand and high relocation costs.

Our approach, which locates organizational foundings in product and geographic space, highlights the nonrecursive nature of industry evolution: the relationship between emergent industry structure and firms' actions is dynamic and iterative. Current industry composition affects the opportunities and constraints perceived by potential new entrants. This affects patterns of organizational founding, which, in turn, cumulatively alter the industry's composition for future periods. Industry structures are thus maps both of and for strategic action (Barley, Freeman, and Hybels, 1992). Our spatial analysis permits us to model directly the micro-macro links that underlie industry evolution. Moreover, because our approach emphasizes systematic links between organizational action and industry structure, it addresses questions central to researchers in organization theory, industrial-organization economics, and strategic management. The recent trend in organizational ecology of investigating dynamic links between organization- and industry-level processes has put us on a path that may enable researchers to answer crucial questions about how organizations' interactions culminate in industry evolution.

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