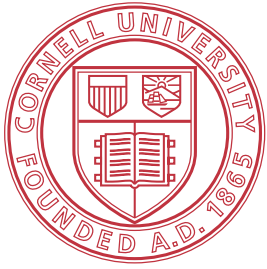


☆☆☆☆☆ *The Agglomeration Conundrum:*
How Co-location Helps Some Hotels and Hurts Others



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and Hurts Others

by Cathy A. Enz, Ph.D.,
Linda Canina, Ph.D.,
and Jeffrey Harrison, Ph.D.

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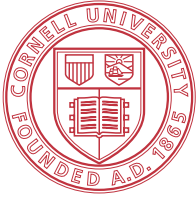
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T H E C E N T E R F O R H O S P I T A L I T Y R E S E A R C H . O R G

The Agglomeration Conundrum:

How Co-location Helps Some Hotels and Hurts Others

**by Cathy A. Enz, Ph.D., Linda Canina, Ph.D.,
and Jeffrey Harrison, Ph.D.**

THIS REPORT SUMMARIZES the RevPAR benefits for hotels that locate in various types of competitive clusters, using data from 14,995 hotels and controlling for numerous demand-shaping factors (e.g., number of rooms, chain affiliation, location, population, and number of retail and dining establishments). Our study found

that hotels that locate in close proximity to higher segmented hotels (e.g., economy hotels with upscale hotels) benefit without making similar product and service investments themselves. Alternatively, co-locating with a high percentage of hotels in lower product segments (e.g., upscale hotels with economy hotels) reduces performance for higher segmented proper-

ties. These effects are magnified by the degree of strategic difference between the focal hotel and the central tendency of the cluster. Being different amplifies the benefit for hotels with a lower-cost orientation. For highly differentiated service providers, the greater the strategic distance from the cluster the more co-location can diminish revenues.

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The authors gratefully acknowledge the assistance of Smith Travel Research and the Center for Hospitality Research at Cornell University in providing access to the comprehensive lodging performance database used in this study. The authors also thank PKF Hospitality Research Group for providing access to a database that included various hotel performance data. All information shared with Cornell University researchers is bound by agreements of non-disclosure and confidentiality. Only aggregate data are provided in this report. A detailed treatment of the research results presented in this report can be found in L. Canina, C. Enz, and J. Harrison "Agglomeration Effects and Strategic Orientations: Evidence from the U.S. Lodging Industry," *Academy of Management Journal* (2005).

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LOCATION IS A CRITICAL FACTOR IN THE HOTEL INDUSTRY, where “location, location, and location” has long been an industry mantra.¹ Location is among the most important determinants that attract guests to hotels, according to some studies,² and others have found that location is an important determinant of a hotel’s pricing decision.³

In this study we examine a specific facet of location—specifically, the effects on hotel revenues of a hotel’s location near to hotels in the

same and other hotel segments. A recent *CHR Report* detailed the revenue lost when hotels in similar market segments (or hotels of the same flag) are located adjacent to each other.⁴ The benefits of competitive clusters are less obvious, but we hypothesized that benefits might exist. We wanted to determine which types of hotel benefit from locating next to others, and what hotels provide benefit to others. If a higher percentage of the hotels in a local market are luxury or high-end properties, for instance, we would expect that economy and midscale hotels

¹ An early instance is attributed to Ellsworth Statler, in connection with the 1920s’ siting of his Cleveland property. See: Floyd Miller, *Statler: America’s Extraordinary Hotelman* (New York: Statler Foundation, 1968). Also see: A.O. Bull, “Pricing a Motel’s Location,” *International Journal of Contemporary Hospitality Management*, Vol. 6, No. 6 (1994), pp. 10–15.

² E.J. Mayo, “A Model of Motel Choice,” *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 15, No. 3 (1974), pp. 55–64; E.R. Cadotte and N. Turgeon, “Key Factors in Guest Satisfaction,” *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 28, No. 4 (1988), pp. 44–51; S. Horak, “Influence of Forested Area in Hotel Vicinity on Hotel Accommodation Prices,” *Turizam*, Vol. 45, No. 5/6 (1997), p. 125.

³ K. Luk, M. Tam, and S. Wong, “Characteristics of Magazine Advertisements on Hotel Service: A Content Analysis,” *Journal of Travel and Tourism Marketing*, Vol. 4, No. 3 (1995), pp. 29–43.

⁴ See: Arturs Kalnins, “Quantifying Impact: The Effect of New Hotels and Brand Conversions on Revenues of Existing Hotels,” *CHR Reports*, Vol. 5, No. 8 (2005), found at TheCenterforHospitalityResearch.org (Cornell University).

would benefit from being in this competitive cluster. In contrast, if a market was populated primarily by budget hotels, hotels in higher-end segments might suffer. In this report we explain the reasoning for our expectations and then present the actual co-location effects from a large study of United States hotels. The study reported here explores which hotel segments boost the fortunes of co-located hotels and which types of hotels benefit from being next to properties in certain hotel segments. The key points in this study are the presence of competitive clusters and the effects on a particular hotel of a cluster's competitive characteristics, known as "agglomeration effects."

The Location Factor

It is not uncommon for companies in any industry to form geographical clusters. For example, competitive clusters exist (or existed) in entertainment (Hollywood), computer technology (Silicon Valley), automobiles (southern Germany and Detroit), textiles (the Carolinas), and many other industries. Competitive clusters are especially common in service industries such as lodging, restaurants, and retail establishments. The characteristics of these competitive clusters vary. For example, in Manhattan, one finds a cluster of exclusive retail stores on upper Madison Avenue, while a group of discount stores is far downtown on 14th Street. However, retailers of all stripes have crowded into Boston's Copley Plaza, where both the Gap and Tiffany are located.

When developers build new hotels they must decide where to locate and in which market segment the property will compete. In choosing a market segment they must consider (among other factors) how similar their property will be to existing operations. If developers build their property too close to other hotels they may not be able to use location as a competitive argument to attract guests away from the existing properties. But if their properties are located too far away they may have to launch extensive advertising campaigns to explain the benefits of their location and prop-

erty to potential customers. As such it is important to compare the benefits of distancing a hotel from others to the benefits of being in close proximity. Exploring the competitive dynamics of hotels in clusters is of interest because the effectiveness of a particular segmentation strategy may depend on the segmentation strategies pursued by other firms in the same market.⁵ Geographic clusters provide an outstanding context in which to study hotel segments, especially because one hotel cluster can be compared to other clusters in different locations.⁶

One way to distinguish among the strategic orientations of hotels in a geographic cluster is by their level of segment differentiation.⁷ If a hotel's differentiation is successful, then it

The effectiveness of one hotel's segmentation strategy may depend on the strategies pursued by other hotels in the same market.

should be able to recover the additional costs through an increased price or higher sales volume.⁸ For example, Mazzeo studied small motel markets and discovered that there are strong incentives for firms to pursue strategies that are different from competitors in their local markets. An important issue is whether one hotel may enjoy some of the benefits associated with the differentiating investments made by other properties in its cluster without making similar investments.

⁵ M. Mazzeo, "Product Choice and Oligopoly Market Structure," *RAND Journal of Economics*, Vol. 33 (2002), pp. 221-242.

⁶ A. Kalnins and W. Chung, "Resource-seeking Co-locate: A Study of Market Entry in the Lodging Industry," *Strategic Management Journal*, Vol. 25 (2004), pp. 689-699; and *Ibid.*

⁷ R.E. Caves and P.J. Williamson, "What Is Product Differentiation, Really?," *Journal of Industrial Economics*, Vol. 34 (1985), pp. 113-132; and M.E. Porter, *Competitive Strategy: Techniques for Analyzing Industries and Competitors* (New York: Free Press, 1980), p. 37.

⁸ M.E. Porter, *Competitive Advantage: Creating and Sustaining Superior Performance* (New York: Free Press, 1985), p. 153.

Many of the arguments underlying the theory of differentiation seem to be consistent with the idea that economic benefits can be retained by the firm that pursues the differentiation strategy. However, this assumption is violated by the observation that firms may quickly imitate the innovations of leading firms.⁹ In these situations, a follower firm achieves some of the benefits while absorbing less of the costs. At the conceptual level, co-location is another example of following the leader, as one firm locates in an area and others follow.

Instead of addressing individual competitors' specific strategies, this study examines the effects on individual hotels of operating in competitive clusters that are composed of ho-

Due to differentiation spillover, a hotel may benefit from competitors' investments that make a location more attractive.

tels in a variety of different product segments. The focus is on how the composition of segments in a local market cluster offers benefit to individual competitors and which hotels gain that benefit.

Hotel classifications are often based on differences in the quality of rooms, amenities, and services offered.¹⁰ The product segments that result from these classifications are an indication of the "credible commitment" made by firms to a particular level of service quality.¹¹ In addition, hotels remain in their segment or service-quality group over time because chains try to create and sustain a "specific image through the quality of amenities and services they pro-

⁹J. Barney, "Firm Resources and Sustained Competitive Advantage," *Journal of Management*, Vol. 17 (1991), pp. 99-120.

¹⁰ Mazzeo, *op.cit.*

¹¹P. Ingram, "Organizational Form as a Solution to the Problem of Credible Commitment: The Evolution of Naming Strategies among U.S. Hotel Chains," *Strategic Management Journal*, Vol. 17 (Special Issue, 1996), pp. 85-98.

vide."¹² The chain-scale scheme developed by Smith Travel Research, which is widely used, comprises five levels: luxury, upscale, midscale with food and beverage services, midscale without food and beverage services, and economy.¹³ We used these segments to represent levels of differentiation in this study, with luxury hotels being most differentiated and economy hotels being least.

It is tempting to assume that co-location is primarily a result of natural advantages associated with particular geographic locations. Such advantages may include proximity to necessary resources such as attractions, waterways, or population centers. However, natural advantages have been found in only about one-fifth of the clusters that researchers have studied.¹⁴ These researchers observe that other factors seem important in a number of geographically concentrated industries. Consequently, we can conclude that other factors (in addition to natural advantages) drive firms to co-locate.

One of those factors seems to be the fact of the cluster itself—or, more specifically, its composition. In a study of the hotel industry in rural Texas, competitive clusters of chains and larger hotels offered benefits to independent and smaller hotels that were co-located in those clusters.¹⁵ Furthermore, Kalnins and Chung found that new hotels are attracted to areas with branded upscale hotels. Unlike interorganizational relationships in the form of joint ventures and alliances, the benefits associated with location proximity can be extracted

¹²S. Rushmore and E. Baum, *Hotels and Motels: Valuations and Market Studies* (Chicago, IL: Appraisal Institute, 2001), p. 165.

¹³To ensure that the classification used in this study was appropriate, we compared the expert placement of brands into these five classifications by the following four different industry expert groups—HVS International, Smith Travel Research, Bear Stearns, and Morgan Stanley. These independent sources consistently converged on the lodging brands they placed in each of the five segments.

¹⁴G. Ellison and E.L. Glaeser, "Evolution of Geographic Concentration of Industry: Does Natural Advantage Explain Co-location?," *American Economic Review*, Vol. 89 (1999), pp. 311-316.

¹⁵W. Chung and A. Kalnins, "Co-location Effects and Performance: A Test of the Texas Lodging Industry," *Strategic Management Journal*, Vol. 22 (2001), pp. 969-988.

from other hotels in the industry cluster without their cooperation or consent.

Co-location's Benefits

Geographic areas that offer a large selection of competing services are attractive for new operators because they draw consumers who experience reduced search costs as a result of the wide variety of firms from which to choose.¹⁶ The benefits of clusters are even more important in the lodging industry because location itself is an inseparable part of the service provided and a high level of product heterogeneity exists.¹⁷ From the hotel operator's perspective, co-location allows closer monitoring of competitors and the ability to respond to specific competitor moves.

An important source of advantage in competitive clusters is what is called differentiation spillover. A hotel may benefit from competitors' investments that make a location more attractive. The existence of luxury and higher-end hotels, for instance, because of their service quality, architectural features, and reputation (to name but a few factors) increase the attractiveness of an area as a destination. A tourist or business traveler is more likely to have a favorable impression about an area because of the presence of the product and service attributes of the differentiated higher-end hotels. Las Vegas is an example of a destination that has benefited greatly from the presence of a cluster of theme-oriented luxury hotels.

While it is clear that hotels' features and services may have the potential to provide differentiation for an individual operation, it is less clear that differentiation on any one service dimension would be sufficient to provide benefits to hotels that locate in the same area. Rather than the influence of a single service dimension, it is the sum of activities and the quality with which they are provided by many

firms that creates a level of differentiation that can provide benefits for other hotels in the cluster. It is also interesting to note that the first firm to enter a particular location may do much to create an advantage for the competitors that follow. On a wider scale, this is clearly the case in Kissimmee, Florida, which was little more than a pleasant town bordered by orange groves before the opening of Walt Disney World.

Consumers look for signals with regard to the level and quality of services that they should expect to receive from a hotel. One of the major signals is the hotel's brand. Firms can use a brand name, such as Ritz-Carlton or Budget Inns, to create expectations for a hotel that a consumer has not yet visited.¹⁸ At the same time, independent hotels can create a "brand" of their own (a brand of one property) so that they can create appropriate expectations, as do branded hotels. For example, The Breakers in Palm Beach is widely regarded as being equal or superior to branded hotels in that market. Two key indicators of differentiation among all hotels are pricing and the types and quality of services provided. Those factors also create a set of expectations in guests with regard to what they will experience.

Hotels and hotel clusters use a variety of means to alert potential consumers to the quality of hotels in an area.¹⁹ For example, consumers are guided by widely used rating services and guidebooks, such as those provided by Mobil and the American Automobile Association (AAA). In addition, firms that differentiate are likely to do more advertising than their less-differentiated competitors, so that they can generate enough revenues to cover increased costs. Such advertising enhances an area's reputation, which can directly increase demand. Travel agencies, although declining

¹⁶ A. Marshall, *Principles of Economics*, 8th Edition, (London: Macmillan, 1920), p. 273.

¹⁷ J. Fischer and J. Harrington, Jr., "Product Variety and Firm Co-location," *RAND Journal of Economics*, Vol. 27, No. 2 (1996), pp. 281-309.

¹⁸ Ingram, *op.cit.*; and B. Wernerfelt, "Umbrella Branding as a Signal of New Product Quality: An Example of Signaling by Posting a Brand," *RAND Journal of Economics*, Vol. 19 (1988), pp. 458-466.

¹⁹ J. Catrett and M. Lynn, "Managing Status in the Hotel Industry," *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 40, No. 1 (February 1999), pp. 26-38.

in influence, also provide a lot of location information to consumers. The internet continues to grow as a key information source for many consumers, many of whom want to see specific descriptions of the lodging properties in an area. Finally, consumers can experience a location in person. The greater their satisfaction, the more likely they are to return to a location. In this regard, differentiation should lead to higher satisfaction levels. All of these factors can increase the performance of hotels in a competitive cluster.

Who Gives and Who Receives Co-location Benefits

Our inquiry hinges on the fact that not all firms benefit equally from co-location. We consider it likely that some segments of the lodging industry will benefit more from co-location than others, because of spillover benefits from higher scale hotels. For example, a midscale hotel may enjoy a relatively higher price as a result of high levels of investment in product quality made by an upscale hotel that is next to it. On the other hand, an upscale hotel may incur an additional cost in the form of relatively lower achievable prices as a result of its location in a cluster of midscale and economy hotels. Providers of high-quality products are

An upscale hotel may face relatively lower achievable prices as a result of its location in a cluster of midscale and economy hotels.

more likely to be the providers of co-location benefits within a cluster, while those at the other end of the product-segment continuum, the lowest quality providers, should capture the greatest benefits. Highly differentiated hotels must charge relatively high prices to recoup the costs of differentiation. All of the state-of-the-art recreational facilities, high-tech entertainment and communications systems, costly art, expensive bedding, and gracious guest rooms

that go into upscale and luxury hotels, not to mention meeting and convention facilities, are both labor and capital intensive. One classic way that low-end hotels benefit from those upscale investments occurs when customers use the public facilities of high-end hotels but stay in nearby low-cost properties.

Given the inevitable difference between the rates that luxury and upscale hotels must charge and the rates offered by low-end hotels that are not burdened by upscale cost factors, a value-conscious consumer will perceive the low-price hotels as bargains compared to the upscale hotels. This should result in higher demand for the “bargain” hotels, which ironically can charge prices that are higher than they would otherwise command if the high-quality hotels did not exist in that competitive cluster. Consequently, one might expect that low-end hotels in competitive clusters characterized by a high level of differentiation would have higher performance than low-end hotels in undifferentiated clusters. Firms are expected to select locations in which the benefits of co-location are at maximum levels given their own strategic orientations.²⁰

Based on the foregoing discussion, we expected low- or moderate-quality, limited-service hotels to enjoy co-location benefits by operating in markets with proportionately more high-differentiation firms. We further expected to find this effect for each segment below the luxury level. That is, upscale properties will enjoy benefits from locating in clusters with a high proportion of luxury hotels, for example, and midscale properties will gain from locating with a high proportion of luxury and upscale hotels. Given these arguments, the following hypothesis arises.

H1a: RevPAR performance will increase for all lower segmented hotels below the

²⁰ F. Flyer and J.M. Shaver, “Location Choices under Co-locate Externalities and Strategic Interaction,” in *Geography and Strategy* (part of the Advances in Strategic Management series, Volume 20), ed. J.A.C. Baum and O. Sorenson (Oxford, UK: JAI/Elsevier, 2003), pp. 193–214; and Kalnins and Chung, *op.cit.*

most highly differentiated luxury segment as a function of the proportion of higher segmented hotels co-locating in the same geographic cluster.

We expect that the opposite argument will hold for luxury hotels located in close physical proximity to firms pursuing a low-cost strategic orientation. Competitors pursuing low-cost strategies in economy and midscale segments do not contribute as much to the attractiveness of a location because they do not offer the range of products and services that attract customers from whom competitors can benefit. If many low-cost providers are found in a particular competitive cluster, spillover effects will be negative for those firms in higher segments pursuing the highest levels of differentiation. In short, firms that pursue a high level of differentiation contribute to the positive co-location effects of others, but when in close proximity to low-cost providers, they suffer a loss from co-location.

H1b: RevPAR performance will decrease for high-end segments as a function of the proportion of other firms co-locating in the same geographic cluster pursuing a lower-end segmentation position.

Support for H1a and H1b will suggest that the product segmentation characteristics of clusters are associated with varying levels of firms' performance. H1a and H1b capture both the beneficial and detrimental performance outcomes from co-location. The major insight rests on exploring the degree to which the mix of product segments can serve as a detrimental or beneficial element of a location strategy. If, as we have just argued, some firms provide benefits while others receive them according to the proportion of various segments represented in a location, a logical next step is to explore which segments benefit the most. That issue requires an examination of whether the greatest strategic distance, that is the degree of difference between a particular hotel and the most common segment of hotels represented in the cluster, will yield the greatest revenue.

Being Different: The Advantage of Strategic Distance

The greater the difference in product segments represented in a local market the greater the effects of co-location. In particular, we argue that a particular property will reap the greatest benefits when its strategic distance is greatest from a cluster dominated by co-located upscale or luxury properties, because a hotel operating in a cluster of highly differentiated properties, will enjoy the benefits of consumers' interest in the cluster's high-end properties. In this case, strategic distance amplifies the benefits for hotels in economy and midscale segments.

The greater the difference in a low-end hotel's strategy from other hotels in its cluster, the better its chances for a revenue boost.

For example, an economy hotel would have a great strategic distance in a cluster characterized by a high average level of differentiation. By contrast, the same hotel operating in a low-differentiation cluster would not have a co-location benefit. Here's how that would work. Say that economy hotel 1 operates in Cluster A, which is made up primarily of higher-end hotels, while economy hotel 2 is in Cluster B, which contains primarily midscale or low-end hotels. Economy hotel 1 (in Cluster A) should have higher co-location-based performance than hotel 2 (in Cluster B), because Cluster A contains more highly differentiated firms and is therefore more attractive to consumers. Furthermore, we argue that the co-location benefit is even greater for economy hotel 1, because its strategic distance from the cluster as a whole is greater than that of hotel 2 from cluster B. We suggest that two competitive advantages are working simultaneously for the hotel in the highly differentiated cluster.

ter. First, the economy or low-cost providers experience co-location benefits due to the large proportion of other firms with greater levels of differentiation. By associating with the cluster the low-cost provider reaps a revenue premium. Second, because the hotel's strategy is so distant from the strategies of other hotels in its cluster it can take advantage of its strategic difference, for example, by gaining occupancy from the spillover of guests from the high-rate hotels. The co-location effect differentiates the cluster, and the distance from the norm mea-

By associating with a cluster of high-end hotels, a low-cost provider reaps a revenue premium.

sures the difference in the strategic orientation of the firm relative to the average orientation of the cluster. Together, the benefits of differentiation spillover and segment difference combine to enhance performance. To capture the enabling and enhancing effect of strategic distance we propose the following hypothesis:

H2a: RevPAR performance will increase for hotels in the lowest segments as a function of the distance between their segment and the average segment mix in their competitive clusters.

The reverse argument should hold true for the most highly differentiated hotels. Less distance between a highly differentiated firm and the norm in the cluster means that the cluster is characterized by hotels that are relatively highly differentiated. Direction of strategic benefit is important because the most highly differentiated firms do not gain demand-enhancing benefits from being in a cluster with lower-end firms. Hence, the greater the strategic distance for higher-end providers, the more likely that the disadvantages of co-location will be magnified, as the following hypothesis suggests:

H2b: RevPAR performance will decrease for hotels pursuing the most highly differentiated product segments as a function of the distance between their segment and the average segment mix in their competitive clusters.

In sum, we argue that co-location effects are magnified by a hotel's strategic distance from the cluster's typical segment mix. Hotels in high-end segments experience co-location detriments that are amplified by being different from the norm of the other hotels, whereas hotels in lower segments experience benefits that are augmented by being different from the norm of other hotels.

Research Approach

Sample. The sample used for this study consisted of 14,995 hotels. We used data obtained from Smith Travel Research, which maintains a database that includes over 98 percent of the chain hotel inventory within the U.S. and is thus representative of the entire U.S. lodging population for branded hotels. The database also includes many independent hotels, which constitute a total of 1,162 firms in the sample.

The STR data consist of monthly hotel-level performance statistics—in this case, room revenue and rooms sold for the year 2000. In addition, Smith Travel supplied categorical variables that describe some of the characteristics of each hotel. These data include (1) the number of rooms in the hotel; (2) the Metropolitan Statistical Area in which the hotel is located; (3) the more narrowly defined market tract in which the hotel is located; (4) the location type of the hotel (i.e., urban, suburban, airport, highway, or resort); (5) the regional location of the hotel; and (6) the segment category of the hotel (using the segments listed earlier in this report). In addition, we collected data by Metropolitan Statistical Area on the population and land area from the U.S. Census Bureau. The count of retail, service, and manufacturing establishments was obtained at the state and county level from the U.S. Census Bureau, County Business Patterns.

Clusters

Co-location effects were measured by STR tract. Smith Travel Research identifies the location of a hotel by both Metropolitan Statistical Area and tract, which is a subset of an MSA market. For example, Boston is divided into ten tracts, the boundaries of which take into account counties and zip codes. A total of 550 tracts currently exist in the U.S. The average number of properties per tract across all tracts in our sample was 27.9. Tracts provide a more refined geographic unit for studying co-location than do MSAs, since tracts better reflect the realistic options available to a consumer who desires to visit a particular location. Since Smith Travel will not reveal the actual identity or exact location of individual properties, even under the exclusive agreement that allows access to other data, the tract provides the smallest location grouping available. For the sake of consistency with our theory sections, we will continue to refer to tracts as competitive clusters or, simply, clusters.

Strategic distance. Strategic distance between a hotel's segment and the central tendency of the segments of other hotels in the cluster (developed to test hypotheses 2a and 2b) was measured using a central-tendency calculation. To measure central tendency, we assigned each strategy segment a number from 1 to 5, where 1 = economy and 5 = luxury. We then calculated each cluster's mean. The distance score was the absolute value of the firm's own value minus the cluster's central tendency.

Performance. RevPAR was calculated by dividing total room revenue by the number of rooms available for sale. We summed monthly revenues for the year and divided by the annual number of rooms available. Monthly data were aggregated to the annual level to eliminate seasonal fluctuations within clusters.

Control Variables

Many factors other than co-location affect the revenue performance of a lodging firm. Chung and Kalnins found that hotels in rural areas enjoyed superior performance when competi-

tors in a cluster were larger than themselves.²¹ A size-based co-location variable was created by measuring the proportion of hotels in a cluster that are larger than the focal firm, based on the number of rooms.

We also added a control for within-cluster product and quality heterogeneity (strategic dispersion). High heterogeneity is one of the reasons a competitive cluster is relatively attractive to potential consumers. By controlling for heterogeneity within the cluster we are better able to test for firm-level differentiation-spillover effects. Indeed, the inclusion of such a measure is a test of whether such heterogeneity really matters. We created a Herfindahl-type index that measures the level of concentration or dispersion of strategy types in a given cluster. To do so, we tallied the number of hotels in each product or quality category, and then divided each tally by the total number of hotels in the cluster. We squared each of these proportions and then summed them. High values suggest that the cluster is concentrated with respect to a segment; low values suggest that the cluster is strategically dispersed. We also controlled for size dispersion with the coefficient of variation, calculated as the standard deviation of within-cluster size divided by the mean.

Although STR does not reveal the identity of hotels, it did provide other information from which we could create control variables, namely, hotel size by number of rooms, whether a hotel is brand affiliated, the location type, and the geographic region of the hotel.

Typically, large hotels charge higher room rates than do small hotels, meaning that there's a positive relationship between size and RevPAR.²² Chung and Kalnins also found relatively high room revenues among hotels located in rural markets that have a high percentage of chain hotels. These findings seem to indicate that chains provide co-location benefits by drawing consumers to rural areas, perhaps due to their advertising and brand recognition.

²¹ Chung and Kalnins, *op.cit.*

²² *Ibid.*

EXHIBIT 1

Results of FGLS analysis for influence of segment co-location on RevPAR

Variable	Luxury	Upscale	Midscale (with F&B)	Midscale (no F&B)	Economy	Overall	
Intercept	151.61***	60.36***	34.70***	19.90***	3.66	61.38***	
Segment Co-location in Clusters							
Proportion of Local Cluster Hotels in ...							
...Higher Segments		.49***	.44***	.30***	.20***	.13***	
...Lower Segments	-.83***						
Segment Dispersion & Hotel Size in Clusters							
Proportion of Hotels of Greater Size	.15*	.12***	-.01	.00	.06***	.03**	
Dispersion of Segments	3.27*	.91	.73	.49	.22	.61	
Dispersion of Hotels size	15.61	6.41	2.92	2.27	7.11**	11.66**	
Controls							
Number of Rooms	-.00	-.00	.02**	-.01*	.03**	.00	
Chain Affiliation	2.46	5.12**	3.27**	17.37***	7.81***	6.71***	
Urban Setting	-23.83***	-7.88*	-10.02***	-4.67*	-6.17*	-8.85***	
Suburban Setting	-27.41***	-8.34**	-12.95***	-6.61**	-6.03*	-9.46***	
Airport Setting	-27.55***	-4.34	-12.16***	-6.13**	-7.39**	-9.44***	
Highway Setting	-31.37***	-8.27*	-12.76***	-8.32***	-8.85**	-11.11***	
Population	-.00**	-.00*	-.00**	-.00**	-.00***	-.00*	
Land	-.00	-.00*	-.00*	-.00	-.00	-.00*	
Establishments	.00**	.00**	.00***	.00***	.00***	.00**	
Mid Atlantic	22.27**	6.11	11.01**	8.05*	7.68**	5.89	
South Atlantic	-3.17	-12.88**	-3.74	-.31	-.73	-6.49*	
Northern		-4.69	-12.01**	-2.18	.31	-2.32	-7.20*
Southern		-11.85	-17.68***	-5.19	-2.13	-2.65	-10.03**
West North Central		-7.65	-16.01***	-2.09	-2.06	-1.87	-8.62**
West South Central		-.64	-13.27**	-2.98	-1.20	-2.23	-8.19*
Mountain		1.92	-10.62	-3.69	-3.66	-1.04	-7.02*
Pacific		19.29	-.28	6.59	5.82	8.30**	2.35
Midscale Hotel							-24.87***
Midscale Hotel (no F&B)							-24.39***
Economy Hotel							-43.70***
Number of observations	1,741	1,887	2,835	3,925	4,607	13,254	
Chi-Square Likelihood Ratio Test	194.87	485.73	555.87	532.36	1041.47	4062.46	
Pr > Chi-Square	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	

Note: Significance of values shown in the above table are shown as follows: $p < .05 = *$, $p < .01 = **$, $p < .0001 = ***$.

Similarly, Ingram discovered that hotels were more likely to survive if they were associated with a particular brand name.²³ Consequently, we controlled for chain affiliation with a dummy variable (called chain affiliation) to represent hotels as either brand affiliated (= 1) or independent (= 0). With regard to the hotel's location, urban and resort locations are expected to have higher RevPAR on average than are suburban, airport, and highway locations. To control for the differences in RevPAR across these location categories, dummy variables were created for each of the location categories, with 1 signifying that a hotel belongs to the category and 0 that it does not. We also expected that hotels in highly populated regions with expensive real estate would have higher RevPAR than hotels in more sparsely populated regions. For example, the cost of hotels in New England and in the Pacific regions may be greater than the cost in more central areas of the country. Similar to the location variables, nine dummy variables were created to capture the different regions of the United States, namely, New England, Mid Atlantic, South Atlantic, North Central, South Central, West North Central, West South Central, Mountain, and Pacific. A few other demand-related variables were measured for each metropolitan area. They include the population, the land area in square miles, and the sum of the number of retail, service, and manufacturing establishments for the metropolitan area to which the hotel belongs.

Statistical methods. We used a feasible generalized least squares (FGLS) procedure to test our hypotheses because of the potential for nonspherical errors.²⁴ Failure to use statistical methods that account for this dependence across observations within a cluster can result in erroneous conclusions.²⁵ Appropriate testing of Hypotheses 1a and 1b requires separate analyses by segment from economy through luxury firms to test for competitive benefits of a

specific segment. Testing is essential at the level of segments to accurately capture the benefits or detriments of co-location by segment.

Study Results

FGLS models for all of the segments are presented in Exhibit 1. In Hypothesis 1a, we predicted that hotels gain spillover RevPAR benefits from co-locating with hotels that pursue higher levels of differentiation. Our data supported this hypothesis. The results indicate the benefits of co-location in a hotel cluster with a high percentage of properties pursuing differentiation strategies. The overall model at the right of Exhibit 1 includes all firms below

For luxury hotels, a location in a cluster of low-end hotels is associated with reduced RevPAR.

the luxury level, along with dummy variables to control for segment effects. Consistent with the tests for H1a, the coefficient for the proportion of properties pursuing a higher level of differentiation is positive.

Hypothesis 1b predicts that luxury firms will see disadvantages from co-location in clusters with a high proportion of less-differentiated competitors. The luxury segment model (shown in the lefthand column of Exhibit 1) demonstrates support for this hypothesis. The coefficient for the proportion of properties in the cluster with a lower level of differentiation is negative and significant. For luxury hotels, a location in a cluster of low-end hotels is associated with lower RevPAR.

Size-based co-location effects were positive and significant only in the economy, upscale, and luxury segments, with no significant size-based co-location effects found for midscale hotels. The controls for heterogeneity were not significant except in the case of strategy dispersion for luxury hotels and size dispersion for economy hotels. Among the control variables,

²³ Ingram, *op.cit.*

²⁴ W.H. Greene, *Econometric Analysis*, 4th edition (Upper Saddle River, NJ: Prentice-Hall, 2000), pp. 465-469.

²⁵ *Ibid.*

number of hotel rooms had significant effects on RevPAR for all but the upscale segment, while positive effects were found in two of the four other segments. The importance of the variables associated with location and region depended on the segment studied. Chain affiliation had a positive effect across the segments, but tended to be more important in the middle segments. This may be because it is harder to create differences that appeal to consumers while pursuing a mid-market strategy, making brand affiliation become a particularly influential determinant of perceived value.

In Hypothesis 2a, we predicted that hotels in low-end segments would enjoy greater spillover effects if their own strategic orientations were distant from their cluster's segment norm (an indication of a greater degree of differentiation in the cluster). For completeness, we also calculated a distance variable for size of the lodging company. Size distance for this variable was measured between a hotel's size and the average size of other hotels in the cluster. In Exhibit 2, the positive and significant coefficient for the variable representing this distance in the economy segment and the midscale without food and beverage segment provides evidence to support Hypothesis 2a. By the same token, the negative and significant coefficients for the distance measures of the three full-service segments provides support for hypothesis 2b, a finding which argues that performance will decrease for firms pursuing the most highly differentiated strategic orientations as a result of the distance between their orientation and the average of the cluster. The pattern of results is consistent with negative effects for the full-service segments above midscale (with food and beverage) and positive effects for the limited service and less differentiated segments. All of the effects were statistically significant.

Discussion and Conclusion

The results show that co-location mainly benefits low-end hotels through differentiation spillover. On the other hand, negative effects of co-location occur for differentiated hotels

operating in a cluster containing firms in lower segments. In fact, luxury hotels appear to suffer the most from negative spillover if a high percentage of the other hotels in their cluster are in lower segments. The tests of the four hypotheses provide fairly strong evidence of the role of co-location in that the predicted location effects are found across all segments. The distance tests provide additional evidence because they demonstrate that the performance of a hotel in a lower segment increases as the average level of segmentation in the competitive cluster increases. Similarly, the performance of high segment hotels diminishes as the cluster becomes increasingly populated with low-end hotels.

These findings have implications for those determining what segment to select for a new hotel. For a differentiation strategy to succeed, the additional revenue generated from offering differentiating features should exceed the additional costs of creating those features.²⁶ However, differentiation attempts can be problematic if the source of differentiation provides benefits to competing hotels without requiring those properties also to make the associated investments. If co-location reduces the ability of high-end hotels to distinguish themselves on factors other than location, then it is possible or even probable that low-end hotels can enjoy some of the performance advantages created by the high-end firms. In the lodging industry high-end competitors may have difficulty preventing low-end competitors from entering the same market because of insufficient entry barriers. Those high-end properties may also find that they are providing the greatest spillover benefits to firms that are most likely to attract their customers.

Our exploration of strategic distance revealed that being different can amplify the benefit for hotels with a low-cost orientation. Proximity to high-end hotels gives a revenue boost for limited-service providers, and the strategic distance between the two magnifies the co-

²⁶ Porter, p. 153.

EXHIBIT 2
Results of FGLS analysis of influence of segment distance on RevPAR

Variable	Luxury	Upscale	Midscale (no F&B)	Midscale (with F&B)	Economy
Intercept	146.05***	92.96***	45.06***	28.99***	12.47**
Strategic Distance Measures					
Distance between central tendency in cluster and...					
...Hotel segment	-26.90***	-16.63***	-10.64***	11.02***	8.88***
...Hotel size	0.02	0.01	0.03***	0.01	-0.00
Control (heterogeneity in cluster)					
Segment dispersion (variety)	3.69**	1.69*	1.44*	0.09	0.47**
Hotel-size dispersion	16.07*	5.07	10.66**	3.16	3.08
Controls					
Number of Rooms	-0.03	-0.03***	0.02**	-0.01**	-0.01
Chain Affiliation	0.29	4.82**	3.44**	17.55***	7.37***
Urban Setting	-23.11***	-7.08*	-9.62***	-4.98*	-6.46*
Suburban Setting	-26.39***	-6.90*	-13.15***	-6.72**	-6.31**
Airport Setting	-26.55***	-2.88	-12.33***	-6.22**	-7.67**
Highway Setting	-29.84***	-6.96*	-13.10***	-8.52***	-9.09
Population	-0.00*	-0.00*	-0.00	-0.00	-0.00***
Land	-0.00	-0.00*	-0.00*	-0.00	-0.00
Establishments	0.00**	0.00**	0.00***	0.00***	0.00***
Mid Atlantic	23.59**	7.95	9.56**	7.65*	8.89**
South Atlantic	1.56	-9.29**	-5.54	-2.20	0.83
Northern	-1.66	-9.30*	-4.65	-1.56	-0.2935
Southern	-5.25	-12.80**	-8.55**	-5.29*	-0.42
West North Central	-3.06	-12.74**	-4.93	-4.25	0.44
West South Central	4.04	-9.39*	-5.93	-2.82	-0.25
Mountain	3.46	-8.69*	-4.88	-5.21*	0.37
Pacific	22.27**	1.40	4.79	4.79	7.99**
Number of observations	1,741	1,887	2,835	3,925	4,607
Chi-Square Likelihood Ratio Test	184.00	468.07	665.69	523.95	939.5
Pr > Chi-Square	<.0001	<.0001	<.0001	<.0001	<.0001

Note: Significance of values shown in the above table are shown as follows: $p < .05 = *$, $p < .01 = **$, $p < .0001 = ***$.

location benefits. For highly differentiated service providers, the greater the strategic distance from the cluster, the larger the likely revenue-diminishing effects of co-location. Extending that argument, when a particular hotel cluster has a low-cost orientation, co-location becomes decreasingly desirable and the disadvantage to a high-end hotel in that cluster increases with the high-end hotel's strategic distance from the cluster's average. To avoid the worst of co-location's effects, luxury hotels might best find locations remote from other hotels.

Low-end hotels' revenue performance is enhanced by co-locating in a cluster with high-differentiation hotels.

We want to emphasize that our theory applies most closely to hotels (and, we suspect, other service firms where location is an especially critical variable to success). For many such businesses (e.g., restaurants, car dealerships) co-location is common and local competition is fierce. Our central arguments follow the reasoning that service firms agglomerate, in part, because of the expectation of increased demand from operating in clusters. Demand-based benefits come from two sources. One source of benefit is from co-location with higher segmented hotels, while the second source of benefit comes from operating a hotel in a segment with the greatest possible strategic distance from that of the other hotels. Heterogeneity makes a location more attractive by reducing search costs through providing the consumer with more choices. Based on our results, these advantages do not appear to accrue equally to all competitors in a cluster.

To gain a clearer picture of firm-level spillover effects, we controlled for cluster heterogeneity based on both segment and size. Adding these controls to our models also represented a test of the idea that heterogeneity makes a location more attractive. The results suggest that the heterogeneity or dispersion of hotel seg-

ments in a market enhances the performance of all but the limited-service midscale segment, but the effect is strongest for luxury hotels. Apparently, high-end hotels are best able to distinguish themselves from hotels that are pursuing a low-end strategy if segment variety is high. Size dispersion has a positive effect for hotels in the luxury and full-service midscale segments. Given that size is one of many factors that make a hotel different from its competitors, this result is interesting in light of the work of Mazzeo, who found that there were incentives associated with being different from competitors in markets comprising small roadside motels.²⁷

Size-based co-location was used as a control variable; however, it is interesting to note that we observed the benefits of size-based co-location for three of the five segments. Performance of the most highly differentiated hotels (i.e., luxury properties) was highest when they operated in clusters of large hotels. A similar effect was found for hotels in the economy segment. These results both confirm and extend past findings. Chung and Kalnins found that size-based co-location influenced performance for hotels in rural areas, which typically host low-end properties.²⁸ We discovered a similar size-based co-location effect for both highly differentiated hotels and low-cost hotels. Most of the individual hotel control variables had significant effects. In particular, we found a positive effect from chain affiliation in all but the luxury segment, where independent hotels remain successful. Hotels that are perceived as highly differentiated "brands of one" may have enough appeal to wealthy consumers to counteract the effects from not being associated with a particular chain brand. On the other hand, the benefits of brands to hotels within other segments are clear. When hotels affiliate with a brand, they share in that brand's image, thus differentiating the hotel from its competitors. Potential consumers select a particular hotel even in the "noise" created by the presence of

²⁷ Mazzeo, *op.cit.*

²⁸ Chung and Kalnins, *op.cit.*

many other hotels in a competitive cluster, because the guests know what to expect. A fruitful area for future study would be to explore the degree to which a multi-brand organization reaps co-location benefits from its own higher-quality brands.

The practical implications of this study are that low-end competitors gain a benefit from locating near a high proportion of differentiated hotels (positive spillover), while high-end hotels lose value from locating near lower-end competitors (negative spillover). With regard to positive spillover, consider a midscale property with food and beverage service that is located in a cluster with 40 percent of the hotels in higher segments. Compare this to a midscale hotel (also with food and beverage) that shares a cluster with 75 percent of hotels in the high-end segments. The difference of 35 percentage points (75% minus 40%) can be multiplied by the coefficient of .4374 (see Exhibit 1, page 14) and then by 365 days per year to determine the incremental potential benefit to the firm in the high-quality cluster—in this case, \$5,587.79. If we multiply this figure by the average hotel size of 144 rooms, the potential benefit of co-location in this hypothetical cluster is over \$800,000 per year. This estimate is particularly important, considering that we controlled for so many other factors that influence demand. We must note that these numbers will vary as

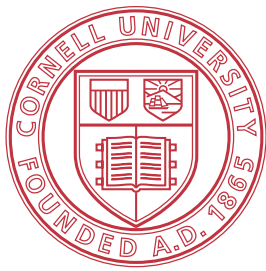
differences across clusters increase or diminish, and that the coefficient varies from segment to segment, with the strongest effects in the luxury segment and the lowest in the economy classification. In addition, it is interesting that the coefficient for the luxury category is $-.8349$ in the lower-cost spillover test, which is nearly double the next highest coefficient. Basically, the results suggest that for higher performance, hotels should try to locate near luxury properties and away from economy hotels.

In conclusion, we found that revenue performance is enhanced by co-locating in a market cluster with hotels that are pursuing high levels of differentiation. We attributed this co-location effect to differentiation-based spillover. We also found evidence of negative spillover for upper-end hotels located among others that were in low-differentiation segments. Furthermore, we found that being distant from the typical market segment represented in the cluster can amplify the benefit for hotels in low segments, while augmenting the loss for those in the highest segments of the business. Chain affiliation was found to be helpful to hotels in all segments, with the largest effects for midmarket hotels. The bottom line is that although some hotels may bear a disproportionate cost associated with differentiating their products or services, other hotels can reap revenue benefits by locating close by. ★★★★★

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