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Entry size, Ownership Form, and Spatial Location: An Analysis of the Hotel Industry

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Abstract

This paper analyses the impact of ownership type on the locating behavior and capacity choice of prospective entrant hotels. An important aspect which has often been neglected in the entry literature is the relevance of the ownership that defines an establishment. A hotel outlet can be company-owned, franchised, or independently owned. The type of ownership is an important driver of the incentive structure for a firm as well as a strategic indicator for its (prospective) competitors, thus this paper argues that ownership form is a necessary explanatory factor in market conduct analysis. We show using a spatial lag model that a disaggregated analysis provides a good understanding of market interaction among hotels.

1 Introduction

According to the American Hotel & Lodging Association, there were over 46,000 hotels nationwide in 2006 with a net growth of about 1,000 establishments each year since 2002. Approximately one-tenth of these establishments are located in Texas, the country's second most attractive travel destination in terms of visitors each year. Due to the importance and the positive growth predictions of the hotel sector (Plunkett, 2006), the idiosyncrasies of this industry have attracted the attention of researchers.

It is apparent that the geographical location choice of a hotel establishment is important as most visitors choose a destination before determining in which hotel they will stay. In the views of a prospective hotel owner, the location choice is based on local demand as well as on the perceived level of competition and characteristics associated with the local market (Baum and Haveman, 1997). A new hotel requires substantial sunk costs due to its construction, so the initial entry choice becomes very important. Locating near competitors yields two potentially offsetting effects: on the one hand, competition leads to a reduction in profits through a decrease in price as supplied quantity increases. On the other hand, the supply shift can implicitly lead to agglomeration economies or 'clustering' where firms benefit from locating near similar businesses (Marshall, 1920).

There is a large literature devoted to analysis of the hotel sector focusing on entry, strategy, and competition. However, the literature is rather limited when it comes to spatial competition modeling, especially with regard to strategic choices made by establishments with different ownership forms.

The objective of this paper is to show that ownership form and spatial location of both entrants and incumbents are important determinants of

entry capacity. We hypothesize that the initial strategic choices among entrants differ depending on the composition (i.e., relative prevalence) of ownership forms in the market. Because of the spatial nature of entry into the hotel industry we need to create a spatially explicit treatment.

1.1 Spatial Competition and Entry

For the case of two identical competing firms, the main model for spatial competition has been formulated by Hotelling (1929). Spatial competition refers to the phenomenon that the decision variable is a function of transport cost which in turn depends on the distance between relevant locations. In the Hotelling model, two homogeneous firms are distributed along a unit line. Each consumer always buys a single good from the closest seller, which means that sales of each firm are solely based on their respective competitors' location. This leads to an equilibrium where each firm can increase their own profit by moving incrementally closer to their competitor and thereby taking over the other's market until they are both located in the center of the one-dimensional space with equal profits. This is an example of an agglomeration result, firms move closer to each other until ultimately they choose the same position. Given its restrictive assumptions, this model does not extend when the number of competitors increase or additional levels of complexity are introduced. The problems associated with a limiting number of competitors (there are only two in Hotelling's model) is solved by Anderson and Neven (1991) who provide a model that explains why a large number of firms agglomerate in a Cournot quantity setting game.

It is an empirical regularity that firms agglomerate in locations where they expect positive demand spillovers (Fujita and Thisse, 1996). An entrant who finds a market consisting of successful establishments may therefore choose to locate there. However, both Hotelling and Anderson and Neven's approach to explaining spatial competition remains incomplete in their description of market behavior, as one would expect the firms' conduct to depend on a more intricate competitive environment.

We must also consider the possibility that local firms are unwilling to accommodate entry. In this case, the local firms foreseeing incumbents could deliberately choose to deter entry by investing in idle capacity to limit local competition. This results in a credible threat to potential entrants as incumbents can reduce price and thereby increase supplied quantity at low cost (Spence, 1977; Conlin and Kadiyali, 2006). Bresnahan and Reiss (1991) formalize this idea to a zero-profit equilibrium of demand threshold that effectively limits further entry in the market.

We will formalize the market structure as an oligopoly. Firms in an oligopolistic market choose a set of actions that maximizes their Nash equilibrium profits. This set contains the firm's strategic choices as well as the choices made by their competitors. Any deviations from the strategy equilibrium results in an overall profit reduction (Tirole, 1988). Each firm builds capacity according to a Cournot game where each firm anticipates the corresponding action from their competitors. We believe the oligopolistic structure fits the hotel industry due its many oligopolistic traits such as the large sunk costs required to start a new hotel, creating a barrier to entry.

As noted by Rosenthal and Strange (2003), firm location and size are important strategic decision variables and they depend on specific characteristics of outlets within the industry. Whereas some differences are easily noticed by the casual observer (such as advertising and brand names), other characteristics may be unobservable even though they potentially influence market outcomes. One crucial aspect of supply side differences which we will look into is ownership form.

1.2 Ownership Form and Oligopoly Game

Whereas differences in ownership form have received much attention in several fields,[1] the market interaction of these forms is largely ignored in the literature. This section develops the connection between these substantially different forms and provides the theoretical framework we use to determine their initial capacity and location decisions.

Firm behavior in a competitive environment heavily depends on internal organizational structure. Porter (1980) introduces strategic groups as a way of distinguishing intra-industry heterogeneity. Dranove et al. (1998) define the existence of true strategic groups as opposed to spurious grouping as 'a function of group characteristics, controlling for firm and industry characteristics.' In this study we focus on groups based on their ownership form: franchise units,[2] company-owned units, and independent units.

According to transaction cost theory, firms should choose ownership form depending on which type maximizes profits. Williamson (1979)(p. 233)

[1] See Caves and Murphy (1976); Jensen and Meckling (1976); Lafontaine (1992)

[2] There are two main forms of franchising agreements, traditional and business-format franchising. The former refers to a division of production and sales, and the latter refers to the sale of a trademark quality controlled product (Lafontaine and Slade, 2001). As we examine the hotel market which uniquely employs the business-format franchising concept we adopt this definition.

notes that "if transaction costs are negligible, the organization of economic activity is irrelevant". By extension, if all outlets are homogeneous, one unique form should be strictly better than another and therefore only one ownership form should be present within any single company (Lafontaine, 1992). Brickley and Dark (1987) show that the choice between franchise and company-ownership for establishments is determined based on perceived agency problems. Their empirical test shows evidence that the probability that a unit is franchised is positively related to the distance to other units and negative to population. The study implies that size of the establishment is not endogenous to ownership form. Shepard (1993) confirms that in the case of oil refiners' control over gas stations of different ownership form, there are strategic differences based on market characteristics, but that the capacity of a station is not a notable variable in the choice of ownership. Kosova et al. (2008) determine that ownership form for a hotel establishment (in this case franchise and company-ownership) is predetermined by the firm in a near optimal way depending on market characteristics. Optimality in this sense is in terms of pricing behavior and performance. According to Rubin (1978) franchising is a good option when monitoring costs are high. The choice of franchising versus company-ownership is then based on moral hazard or adverse selection concerns (Levinthal, 1984). These problems are potentially reduced for franchisees since they receive a substantial share of revenues, unlike company-owned hotel managers, which ensures their best effort (Jensen and Meckling, 1976). Consequently it is important to account for costs of monitoring as a function of distance as well as the related distinction between rural and urban observations.

Monitoring is related to the concept of shirking, which may occur when a manager or employee is tempted to obtain additional benefits and thus potentially harming the firm. Shirking is especially common when ownership is divided across multiple shareholders and when a firm's outlets are geographically dispersed (Demsetz, 1983; Jensen and Meckling, 1976). This is a problem that hierarchically structured firms need to address, but that leaves independent firms unaffected because of the lack of a hierarchy. The location of an establishment relative to others within the same company determines the degree of observability, or monitoring, from a managerial standpoint which leads to this problem (Caves and Murphy, 1976). The profit-maximization hypothesis on which most of economic theory is based is empirically contingent on the distribution of profits among shareholders. This inspires the firm to choose hierarchical agreements which ensure that each agent provides the desired effort (Tirole, 1988).

Another important distinction to consider is the fundamental organi-

zational and strategic differences between ownership forms, specifically between franchise and company-owned firms. In particular, the hierarchical relation between franchisor and franchisee causes substantially different behavior as compared to the company-owned outlets. For example, a franchisee is given more freedom in short-run strategic decisions such as pricing and controlling costs. This is in part caused by antitrust legislation regarding resale price maintenance.[3] Company ownership on the other hand can prove beneficial when less flexibility is required or desired from the individual unit. (Caves and Murphy, 1976)

The independent units are unconstrained from a managerial standpoint. There is no hierarchy that constrains their pricing and location choices since there is no upper level management. However, these units do not have access to managerial advice, large scale advertising, or brand recognition, and thus compared to the other two forms the independent units are expected to have less market information. Independent owners are also strongly affected by bounded rationality as they also constitute the managers of the unit and are thereby forced to locate in their local area. This means that the independent owner is faced with an entrepreneurial choice: either start a new establishment or begin employment at an existing firm resulting in relatively low opportunity cost (Love, 1996). Compared to the other ownership types, independents may therefore appear to accept lower pecuniary payoffs.

Franchise units are more independently managed in comparison to their company-owned counterparts, as noted by Rubin (1978), but they are subject to follow certain guidelines delivered by the associated franchisor.[4] This is to prevent the risk of moral hazard in a franchise agreement as a franchisee may save on costs by allowing for quality deterioration, yet still reaping benefits from known quality standards and advertisement. To alleviate the free riding problem outlets are subject to a franchise fee that partially goes towards policing the required conduct of franchisees. Also due to the increase of monitoring costs with distance, firms are more prone to franchise rural outlets than to assume full company ownership for them. (Shane, 1998)

A company-owned unit has a rigid management structure because of a strict and enforced hierarchical agreement in the company. Due to this hierarchy, individual units are unable to quickly adjust to market conditions. However, in accordance with Kalnins et al. (2008) we would expect them to have fewer pricing errors as these units have access to information on pricing

[3] See Consumer Goods Pricing Act of 1975, 89 Stat. 101 (1975). This law imposes a vertical restraint on franchisor influence over franchisee strategic decisions.

[4] Rubin (1978) also makes a strong case for dismissing capital market explanations as a reason to for a firm to franchise.

and location choices provided by the main corporate office. This leads units of this type of ownership to be more likely to accurately profit-maximize than the less hierarchical forms.

These incentive structures signal strong strategic differences among owners: independent firms can establish in locations where chains would be relatively less profitable. This is because the opportunity cost of establishing a chain unit is higher, whereas for the independent owner it only compares to local employment.

It is important to note that the decision maker can be either a chain or an independent entrepreneur. The former can choose between complete ownership or allowing a franchisee to take care of the operation. The latter can choose between applying for a franchise or start a new independent establishment. A chain has only a small fraction of its wealth tied into a specific outlet, but a franchised establishment represents a substantial investment for an individual franchisee. This would cause a franchisee to under-invest as compared to the company-owner. (Brickley and Dark, 1987) Still, the economies of scale for a chain are greater than the those for a completely independent outlet, which would cause franchisees to invest more in relative terms than independent owners. (Carney and Gedajlovic, 1991)

Another explanation which relates to the same concept is economies of scale with respect to entrepreneurial capacity. The greater the size of the establishment, the higher we would expect from the local manager. Many company-owned outlets act as breeding grounds for competent managers for future franchises. From this perspective we would expect that managers at company-owned outlets have the highest capacity followed by franchisees. The efficiency of the franchise manager should be higher than that of the salaried company-owned manager, yet this should not be reflected in the chosen size of the establishment, but rather a change in the day to day activities, such as pricing or other. (Jensen and Meckling, 1976; Rubin, 1978)The independent entrepreneur would be the least likely to have high entrepreneurial capacity in this market. (Norton, 1988)

In accordance with all the given facts, we hypothesize that, ceteris paribus, independent units are smaller than franchises, which in turn are smaller than company-owned units. Assuming that all else is held constant is important as we need to correct for any relevant market and environmental factors in our model. Based on this framework we test how entrants are affected by their competitive and geographical environment. We expect to find evidence that agglomeration patterns affect likelihood of entry and that local concentration levels positively affect entry. We further explore local agglomeration by examining whether high levels of idle capacity deter entry

and, conversely, that high occupancy rates signal high local demand which accommodates entry.

2 Capacity and Location Choice for Hotels

For our applied example we examine the hotel industry. The ownership variables are expected to follow the structure given in the theory section (1.2). Company-owned hotels invest in higher capacities than do other hotels and independent hotels are expected to invest in in the least capacity. Potentially, due to the lack of active competition from the company-owned units, franchise and independent units will enter the market with larger capacities when exposed to company-owned hotels than hotels of any other kind.

The hotel sector is heterogeneous in several other aspects that affect their initial capacity choices. Demand substitutability between hotels depends on perceived luxury levels. Kalnins and Chung (2004) find that upscale hotels act as catalysts, meaning that other hotels tend to co-locate with them, and refer to this behavior as resource seeking agglomeration. Another important distinction is the geographic divide between urban and rural hotels. Part of this division is due to the geographic location. Company-owned units are more prevalent in the urban areas, whereas franchise units are more likely to be observed in rural areas (Rubin, 1978; Thompson, 1992). This indicates that the hotel sector does not satisfy the necessary homogeneity requirement proposed by Lafontaine (1992) and therefore the idea of a strict division of ownership forms is rejected as many hotel companies offer a mix between franchise and company-owned units (Kalnins, 2004).

2.1 Deriving the Reaction Functions

Conjectural elasticities are normally used in analyzing empirical spatial competition,[5] though it is only applicable when a response is anticipated from competitors. For a sequential capacity setting game, such as entry into markets with restructuring costs, we cannot expect this behavior in the short to medium run. Nevertheless, we do expect there to be some spatial correlation among entrants.

Our entry model builds on a spatial framework incorporating the geographical neighbors of the focal hotel. We assume that a prospective entrant examines the market prior to establishing a hotel and receives information

[5] See for example Mobley (2003).

about the current local competitive conditions.[6] Each hotel's reaction function could contain characteristics such as its ownership form, luxury level, occupancy level, along with factors representing localization economies.[7] Modeling market behavior without considering neighboring hotels would thereby cause omitted variable bias. For example, we can observe that company-owned hotels are relatively large compared to independent hotels, but we claim that this a cause of the prevalence of other large hotels in the relevant market area, rather than simply its own ownership type.

Following the theoretical capacity setting framework by Spence (1977) we construct a simple reaction function shown as Equation (1):

$$k_i = R(k_{-i}) \tag{1}$$

where k_i is firm i's capacity reaction function which is a function of competitor(s) capacity k_{-i}.[8] It is important to note that since k_{-i} represents the capacity reaction function for all competitors, it includes both a) the predetermined total incumbent neighborhood capacity which is unaffected by the focal hotel, and b) other entrants in the same time period who can be affected. This means that the entrant does not cause contemporaneous spillovers for existing hotels, but does for other entrants.

To adjust Equation (1) for the different types of competitors as well as shifters for the focal hotel, we add notation for time periods (t) as well as other factors that influence firm i's reaction function.

$$k_{it} = R\Big(x_{it}, z_{it}, k_{-it}\left(x_{-it}, z_{-it}\right), \bar{k}_{it}\left(\bar{x}_{it-2}, \bar{z}_{it-2}\right)\Big) \tag{2}$$

Equation (2) includes own-firm specific factors as described above[9] x_{it} as well as urbanization and localization factors which are treated as the exogenous economic environment, z_{it}. Urbanization factors include number of residents in the area as well as densities of other service and retail establishments. The capacity function for all other entrants in period t, k_{-it}, has the same interpretation as the focal hotel for x_{-it}, z_{-it}. Establishments older

[6] In the literature it is common to use two years as the lag between observing the market and opening the hotel.

[7] This is supported by Kalnins and Chung (2004) who analyze factors affecting number of hotels of different forms in a zip code. However, they use neither capacity nor occupancy rates as strategic decision variables.

[8] According to Eaton and Ware (1987), it is reasonable to assume that entrants are myopic in the sense that they do not consider the implications of future (unknown) entrants in their market.

[9] These factors include prices, luxury levels and occupancy rates.

than two time periods, referred to as incumbent hotels, are denoted using similar notation: $\bar{k}_{it}\,(\bar{x}_{it-2}, \bar{z}_{it-2})$.

2.2 Data

In this section, we introduce the data as well as a univariate descriptive analysis of the data to demonstrate differences among different locations and ownership types. [10] The data consists of quarterly observations of all hotels in Texas between January 1997 and July 2005. The main sources are the State of Texas Comptroller's Office's tax file and the Source Strategy Inc. which provides data on Texas hotels. These sources define a hotel as a public facility that offers lodging for at least $15 per night and where the length of stay is less than a calendar month. In order to avoid confusion with outliers such as bed and breakfast establishments in the analysis all hotels are required to have at least a ten room capacity (McCann and Vroom, 2007).

We will present data regarding the spread of ownership forms and number of hotels in Texas in cartograms. A cartogram is a thematic map representation which shows where each area is represented by an icon corresponding to the magnitude of a variable. In this case, Figure 1 uses this technique to indicate visual evidence that the proportion of each ownership type varies across space. White circles represent low value outliers and the red circles (darkest) show high value outliers. Independent hotels appear to be scattered almost evenly through space. The franchise hotels appear to be more concentrated in certain areas, although only slightly. Lastly, company-owned hotels are predominantly present in urban areas.

Figure 2 shows the geographical dispersion of hotels among counties in Texas. The dark shades indicate a high number of hotels, and as one would expect hotels appear to be predominantly located in the major metropolitan areas. Austin is indicated by a big star, and the three smaller ones represent San Antonio, Dallas, and Houston, ordered from west to east. These areas dominate both in numbers of incumbent and entrant hotels.

The data contains information on firm specific attributes such as capacities, occupancy rates, prices, and luxury levels. Other explanatory variables include zip code characteristics such as the population of the area, its mean income, number of gas stations, and number of commercial establishments. These variables are used to show how lucrative certain business environments are in comparison to others.

[10] The data for this paper are also used by Vroom and Gimeno (2007).

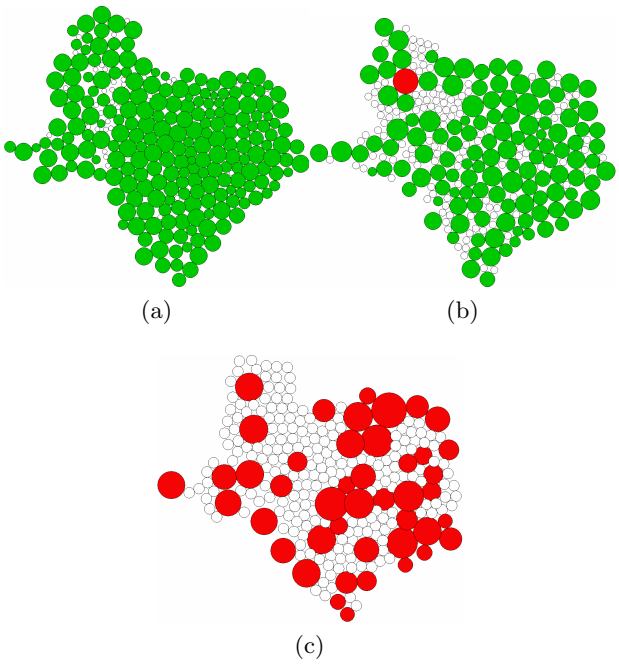

Figure 1: Cartogram of relative proportion of ownership type a) independent, b) franchise, and c) company-owned), Summer 2005.
(White - Low outlier, Green - Default, Red - High outlier)

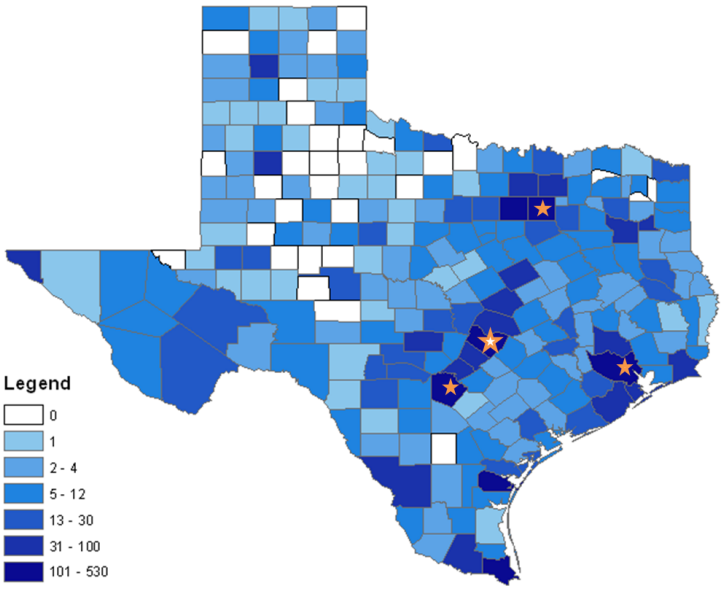

Figure 2: Number of hotels per county in Texas, Summer 2005

Most of the observations in the database have clear geographic coordinates for spatial analysis. However, geocoding data usually poses certain problems. In this case there are hotels that do not have proper addresses that can be used to assign them to their latitude and longitude location. The result is that in a few cases the data available places hotels at the exact same coordinates. After close individual inspection of each of these observations each hotel was assigned a random metric value to their latitude in order to separate the observations from one another.

Table 1 contains descriptive statistics from the data with variable names in parentheses.

Table 1: Descriptive statistics

Variable	Unit	Mean	Std. Dev.	Min	Max
Capacity (CAP)	Rooms	89.5	98.28	11	1841
Businesses in Zip (ESTAB)	Count	728.2	561.7	2	2977
Mean income in Zip (INC)		20360	11650	5747	283189
Luxury level (LUXURY)	Rating	1.139	1.4	0	6
Company-Owned (CO)	Count	0.1365	0.3433	0	1
Franchise-Owned (FR)	Count	0.3937	0.4886	0	1

3 Econometric Model and Results

The operational model for Equation (2) requires a pre-specification of the hotels' neighborhoods. This is achieved by interacting the neighboring hotels with a spatial weight matrix some time prior to the establishment of the hotel. We declare the local market to be defined as the closest 15 neighbors.[11] This method yields the average hotel capacity from local incumbent hotels ($wCAP$). Looking at capacity in Table 1 reveals that standard deviation is greater than the mean. In order to reduce the inherent heteroskedasticity of the data as hotels vary tremendously across space we construct a capacity index ($\%CAP$) according to Equation (3).

$$\%CAP = \frac{CAP}{wCAP} \tag{3}$$

This addition alleviates some of the issues from unobserved factors affecting the dependent variable. For example, we cannot observe whether large incumbent hotels are likely to be located near local attractions, such as important monuments, prior to the time series data. The index will then remove this source of misspecification bias.

The Z variables are estimated using the Gaussian Kriging method based on county level data. The two estimated variables are the natural log of millions of per capita income, and the natural log net change in non-farm business establishments. After calculating $\%CAP$ and estimating the Krig variables for the market at time t, all non-entrants are removed from the system.

Without complete geographical information it is difficult, if not impossible, to accurately determine exact eligible locations for new hotels. Baum and Haveman (1997) therefore suggest that the location of entrants should be exogenously determined as the endogenous alternative would be empirically strenuous taken into account that information on all available locations needs to be considered.

As this model is concerned with the geographical aspect of competition as well as economic variables, the relevant types of weight matrices to consider are either contiguity, distance, or k-nearest neighbor based. We dismiss the contiguity matrices since the data is spatial points and not polygons. The distance based measure is often used empirically in this type of model,[12]

[11] Similar methods are used by Kalnins (2004) and Kalnins and Chung (2004) who consider different specifications of exogenous stock hotels.

[12] A relevant empirical spatial econometrics and competition application is Kalnins (2003).

but as we are modeling an entire state instead of for example Metropolitan Statistical Areas (MSAs), the distance between hotels can become very far. This is especially true when analyzing entrants in lieu of all existing establishments. In this scenario, the k-nearest neighbor pattern becomes the best choice.[13] In this model this implies that the market is observed as it appears for an entrant two years prior to the opening of the hotel.[14]

Equation (2) is converted to an estimable regression model as shown in Equation (4) by adding two additional components and changing the dependent variable to our size index.

$$[\%CAP_{t+1}] = \rho W[\%CAP_{t+1}] + X_{t+1}\beta + Z_t\gamma + \varepsilon_{t+1} \tag{4}$$

First, it is important to note that Equation (4) contains spatial spillover effects accumulated over time as represented by the endogenous term k_{-it} on the right hand side. This signifies that each entrants' reaction function is a function of neighboring entrants in the system. Second, as we observe entrants between 1999 and 2005, time specific effects could potentially play a role. We need to account for this effect when constructing appropriate weight matrices for the model as well. This leads to a block diagonal structure of the weight matrix where each block represents the weights of entrants in one specific time period, t. Early stage testing shows no evidence of significant effects from time dummy variables which is why they are excluded from the model. Third, using $\%CAP$ we facilitate the interpretation of the variables in the model. If local market characteristics and demographic data are the only explanations for size, we would expect all ownership variables to be insignificant.

The first term on the right hand side of equation (4) shows the endogenous spatial process noted by $\rho W k_{it}$. The term represents how current period entrants are lag dependent across space. All prior entrants (current incumbents) are also observed, but as their entry decision is already resolved there are no feedback effects from the new entrants.

Table 2 shows the results for the three sets of regressions from our two models. The first three are ordinary least squares regressions and the latter three are their spatial lag model equivalents. There is a series of Lagrange Multiplier tests for each OLS regression, all showing evidence of the presence of a spatial lag.[15] The first test omits the franchise dummy variable and

[13] Mobley (2003) among others confirm the appropriate use of the k-nearest neighbor weight matrices.

[14] The two year lag allows for the construction of the hotel.

[15] LM-lag = 4.4304 (p-value = 0.035), LM-lag = 4.65 (p-value = 0.031), and LM-lag =

establishes it as base, the second test omits the independent category to establish it as a base, and the third drops the intercept which allows for all three ownership forms to be included without causing perfect collinearity.

All spatial lag models show positive spatial autocorrelation meaning that entrants are influencing each other across space and that there is support for agglomeration of entrants. All models use the capacity index as their dependent variable. The residual autocorrelation test reveals that there is no presence of a spatial error component after correcting for the spatial lag.

Overall, the coefficients in all three models are similarly interpretable where they are significant. LUXURY is positive and significant as expected as luxurious hotels tend to be larger.

Table 3 shows the total effect for each ownership type calculated at the means. This is important as it gives a more meaningful interpretation of the relevant variables. Focusing on model LAG-INT, this table shows that the *ceteris paribus* effect of franchise and independent hotel size is not vastly different, but that company-owned hotels are large even when other factors are considered.

4 Discussion

This paper contributes to current research by combining two important factors, these being the influence of ownership forms and spatial location. According to Thisse and Vives (1988), not enough attention has been given to strategic policy in spatially oligopolistic environments. Furthermore, economists often face data limitations due to the proprietary nature of firm-specific data or transaction costs associated with obtaining data. For large firms this problem is substantial as many of them refuse to release any data at all. Requiring models to be dependent on strictly specified cost structures will thus effectively prevent researchers from closely inspecting markets where firms like these are present.

If indeed ownership forms strongly affect market outcomes according to my hypotheses, this is a reason for increased lobbying efforts between local businesses and chambers of commerce. For example, company-owned and

4.49 (p-value = 0.034), respectively. It would be surprising if the tests were drastically different from one another as there is little change in specification between the models. In each run we note that the test scores were greater for the spatial lag than the spatial error processes indicating our chosen model (Anselin and Bera, 1998, p. 279). All robust LM tests were insignificant indicating that there are no spatial error processes accounted for in our lag models. This is likely due to the construction of the dependent variable which reduces omitted variable bias in the model.

Table 2: Results table

CAP/wCAP	OLS-FR	OLS-IND	OLS-INT	LAG-FR	LAG-IND	LAG-INT
Intercept	2.162***	0.815***	-	2.085***	0.729***	-
	(0.223)	(0.178)	-	(0.224)	(0.181)	-
FR	-	1.434***	2.252***	-	1.455***	2.186***
	-	(0.312)	(0.259)	-	(0.31)	(0.259)
IND	-1.473***	-	0.729***	-1.481***	-	0.647***
	(0.306)	-	(0.194)	(0.303)	-	(0.197)
CO	2.012**	3.181***	4.011***	2.097**	3.269***	4.003***
	(0.979)	(0.975)	(0.959)	(0.972)	(0.968)	(0.951)
Estab. (FR)	-	-0.118	-0.309**	-	-0.129	-0.292*
	-	(0.184)	(0.139)	-	(0.183)	(0.138)
Estab. (IND)	0.148	-	-0.181	0.159	-	-0.154
	(0.186)	-	(0.122)	(0.184)	-	(0.121)
Estab. (CO)	-0.124	-0.246	-0.437**	-0.129	-0.262	-0.425*
	(0.25)	(0.241)	(0.208)	(0.248)	(0.239)	(0.206)
Estab.	-0.308**	-0.191	-	-0.29**	-0.163	-
	(0.138)	(0.122)	-	(0.138)	(0.121)	-
Luxury	0.145***	0.148***	0.147***	0.144***	0.147***	0.147***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Inc. (FR)	-	-0.027	-0.026	-	-0.029	-0.029
	-	(0.019)	(0.018)	-	(0.019)	(0.017)
Inc. (IND)	0.026*	-	0.011	0.026*	-	0.01
	(0.014)	-	(0.01)	(0.014)	-	(0.01)
Inc. (CO)	-0.243**	-0.244**	-0.243**	-0.249**	-0.25**	-0.25**
	(0.099)	(0.099)	(0.099)	(0.099)	(0.099)	(0.099)
Inc.	-0.016	0.001	-	-0.018*	0	-
	(0.011)	(0.008)	-	(0.011)	(0.008)	-
%Occup. (FR)	-	-0.019***	-0.024***	-	-0.019***	-0.024***
	-	(0.005)	(0.003)	-	(0.005)	(0.003)
%Occup. (IND)	0.019***	-	-0.006*	0.019***	-	-0.006*
	(0.005)	-	(0.003)	(0.005)	-	(0.003)
%Occup. (CO)	0.015*	-0.003	-0.009	0.015*	-0.004	-0.009
	(0.008)	(0.008)	(0.007)	(0.008)	(0.008)	(0.007)
%Occup.	-0.024***	-0.006*	-	-0.024***	-0.006*	-
	(0.003)	(0.003)	-	(0.003)	(0.003)	-
ρ	-	-	-	0.13174	0.13454	0.13208

Table 3: Total effect evaluated at means

	OLS-FR	OLS-IND	OLS-INT	LAG-FR	LAG-IND	LAG-INT
FR	-	0.0819	0.565	-	0.0904	0.5396
IND	-0.0841	-	0.4845	-0.0929	-	0.4514
CO	0.5564	0.6291	1.113	0.6426	0.7244	1.1712

franchised units are likely to raise prices for nearby hotels. This gives an incentive for independent business owners to attract the attention of large chains. This will also bring more revenue to the community, which is of interest for the chamber of commerce. Trying to convince firms to locate in rural areas could be difficult, yet it would be beneficial for local communities as well as their lodging sector.

An extension of this study would be to alter zoning policies for city planning purposes. Depending on local needs and market conditions, cities or county governments should try to attract specific forms of hotels, which can be partly done by either lifting or otherwise changing their current zoning restrictions.

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