Organizational Form and Performance: Evidence from the Hotel Industry

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Abstract

We use a unique proprietary monthly panel data set on the operations of a large hotel firm to study the effect of vertical integration decisions on the pricing and performance (occupancy rate and RevPar) of individual hotels. Aggregate data patterns – which managers pay most attention to – suggest sizeable performance differences between franchised and non-franchised hotels. However, empirical analyses controlling for observable and unobservable characteristics show that if significant at all, such differences are economically much smaller than what mean comparisons suggest. Furthermore, once we endogenize the choice of organizational form using information about the Company's other hotels in the same local market, the differences are both statistically and economically insignificant. We conclude that the Company chooses which hotels to franchise and to own optimally such that, conditional on hotel and market characteristics, it achieves consistent results – in terms of revenues per room, occupancy rates, and prices – on average across the two sets of hotels.

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1. Introduction

How firms organize their transactions, and what effect this has on their performance, are central issues in economics. A number of different theoretical approaches have been used to explain when and where we should expect different organizational forms to be used. Empirical research in this area has established a strong link between transaction characteristics and the likelihood that a transaction is organized in house or not (the make-or-buy decision), and between transaction characteristics and the terms of contractual agreements used to manage those that are not brought in house.[1] Much less is known, however, about the effect of organizational form decisions on outcomes. This may seem surprising given the fundamental interest in establishing the value of using various organizational alternatives. Indeed, as noted by Mullainathan and Scharfstein (2001), what matters at the end of the day are differences in behavior or performance: do vertically integrated firms, or firms that rely on particular contractual arrangements or contract terms with their suppliers or retailers, behave differently and/or perform better or worse than those that do not? And if not, why not? These questions are particularly important given that organizational form decisions often involve long-term commitments and sizable investments. As such, differences in outcomes due to such decisions can affect the firm's long-term competitiveness and survival.[2]

Empirical studies of the effects of organizational form, however, are relatively rare for a reason. Fundamentally, the effects of organizational form or contractual decisions are difficult to identify empirically given that firms do not make such choices randomly. In particular, parties

[1] For recent surveys of the empirical literature on vertical integration, see Joskow (2005), Klein (2005) and Lafontaine and Slade (2007). For a review of the empirical literature on inter-firm contracts, see Lafontaine and Slade (2010).
[2] Novak and Stern (2008) consider the "spillover" effects of vertical integration decisions in the auto industry. They find a negative effect of vertical integration on performance in the short term, but greater performance over the life cycle with higher levels of vertical integration. Similarly, Forbes and Lederman (2007) examine how organizational form choices for a given transaction in the airline industry impacts the performance of other units in a network. Our focus, in contrast, is on the direct effect of organizational form on each hotel's pricing and performance.

choose various options based on what they expect will give the best outcome in a given situation.[3] This, of course, is exactly what the literature on organizational form decision relies upon and tries to capture. Unfortunately, this also raises important endogeneity issues when it comes to assessing the effects of organizational form or contractual practices on outcomes.

This paper relies on a unique proprietary panel dataset on the operations of a large hotel firm to study the effect of vertical integration decisions on the performance of individual hotels. The Company, whose identity we cannot reveal for confidentiality reasons, operates several hotel chains in numerous countries around the world.[4] Our data are about the 1194 hotels that the Company has established in a particular country. Our information on these is quite detailed, including monthly hotel-level information on price, as well as standard industry performance metrics, namely occupancy rates and revenues per available room, over a period of 34 months. We also know individual hotel size, age, and many other hotel characteristics, as well as characteristics of the local markets in which each hotel operates. We can therefore control for many hotel and market characteristics that are expected to affect hotel-level pricing decisions and performance. In particular, while we do not have profit data - and would worry about using these if we did, for reasons we describe further below - we can control for brand and hotel amenities that affect costs. Moreover, the panel nature of our data allows us to control for hotel-level unobserved correlated heterogeneity, and thus correct for the traditional self-selection bias in this type of study, or the possibility that unobserved hotel characteristics (or "hotel-fixed effects"), such as the quality of hotel management, or unobserved market characteristics may affect both the use of a particular contractual arrangement and observed outcomes.

[3] See Masten (1993) and Yvrande-Billon and Saussier (2005) for more discussion.
[4] We sincerely thank the director of franchising of this corporation for access to these data. Throughout, we refer to this corporation as the "Company." For confidentiality reasons, we have agreed not to reveal the number of chains or the markets in which the firm operates.

Controlling for unobserved heterogeneity, or hotel fixed effects, however, does not resolve the identification issue if factors that affect organizational form and outcomes can change over time within hotels. Unfortunately, this is likely the case as managers often react to changes in the environment by modifying several things at once, including perhaps unobserved (by the econometrician) characteristics of a business and the terms of contracts under which it operates. Identifying the effect of organizational form then requires an instrumental variable approach. As noted by Lafontaine and Slade (2007), valid instruments have been particularly difficult to find in this literature: it is rare that a variable that is expected to affect the likelihood that a contract term is used will not also affect performance directly. Fortunately we have data on all the Company's operations, across its several brands. We can therefore use the decisions that the Company has made, in terms of organizational form, for all its other hotels in the local market as an instrument for organizational form at a particular hotel. The organizational form the Company chooses for other hotels in the same market is an ideal instrument as it affects the Company's cost of using a particular governance form for a focal hotel, and hence the decision to franchise or operate a particular hotel corporately, yet for reasons we elaborate on below, it is not expected to impact the *individual* hotel's behavior or performance directly.

We find that comparing unconditional average outcomes between franchised and company owned hotels reveals important and statistically significant differences, in the form of lower occupancy rates and higher prices among franchised than corporate hotels. Once we control for hotel and market characteristics in regression analyses, however, as indeed we should, we find lower revenues per available room (RevPar) and lower prices in franchised compared to company-owned hotels. More importantly these differences are now quite small compared to the effects of other hotel or market characteristics, such as presence or not of air conditioning and tourism

intensity. Finally, these performance differences are both economically and statistically insignificant when we endogenize the choice of organizational form.

These results are robust across numerous specifications we estimate and imply that the Company chooses which hotels to franchise and which to own in a way that yields no differences, on average, in either pricing or performance between the two sets of hotels. Our results are further echoed by quantile regressions which in addition show that performance between the two organizational forms is quite similar also across other parts of distributions beside the means. These findings are important as they imply that contrary to what has been found in studies of effects where changes in organizational forms were mandated, when firms' governance choices are unrestricted by government policy, conditional on other outlet, firm and market characteristics, firms can manage to choose in such a way that outcomes are no different across governance forms. In that sense, our results support the transaction cost economics argument suggesting that differences in outcomes due to organizational form *per se* should erode over time.[5]

The paper is organized as follows. In the next section, we review existing evidence on the effect of organization on firm behavior and outcomes, and in particular the reasons why one might expect pricing and performance differences between franchised and corporate units within franchised chains. We also explain the fundamental problem of selection that complicates analyses of the performance effects of organizational form. In section 3, we describe our data and present some preliminary evidence on performance differentials. In Section 4 we discuss our empirical methodology and results. We conclude and discuss some policy implications in Section 5.

2. Organizational Form and Performance

2.1 A Brief Overview of the Literature

[5] See e.g. Yvrande-Billon and Saussier (2005) for a discussion of dynamic implications of transaction cost economics that implies that such differences should disappear over time as firms fail, or reorganize, or modify their transactions.

Mullainathan and Scharfstein (2001) note that although the theoretical literature is replete with models characterizing how and why firm boundaries should matter for firm behavior and performance, little attention has been given to this question empirically. To our knowledge, Shelton (1967) first addressed this question by measuring the effect of switching from franchising to company ownership, and from company ownership back to franchising, on chain outlet costs, revenues, and profits. He found no tendency for revenues to differ across the two governance regimes. However, under company ownership, costs were higher, and hence profits lower, than under franchising.

The main advantage of Shelton's study was that its within-outlet design held outlet and market characteristics constant as the mode of organization changed. Its main drawback, however, was that units in the chain he studied were operated under company ownership only during transition periods. In other words, franchising was the preferred mode of organization in that chain, and company ownership only a transitory phase at any given outlet. It is not too surprising, in that context, that company ownership turned out to be a low performance (high cost) organizational form. Also, Shelton relied on accounting cost and profit data, which, unfortunately, are especially problematic in the context of franchising. Specifically, as independent business owners, franchisees can make accounting decisions to benefit them, for example, from a tax perspective. [6] That reported profits and costs can be manipulated by franchisees is mentioned as a main reason why franchisors base their royalty and advertising fees on revenues.

Despite these drawbacks, Shelton's analyses and findings were ground breaking. Still, authors who have since analyzed differences in firm performance or behavior across governance forms, have chosen to rely more on "natural experiments" arising from changes in regulatory

[6] In its 2003 Uniform Franchise Offering Circular, among a series of caveats relating to cost estimation from franchised store data, McDonald's states that "…organization overhead costs, such as salaries and benefits of non-restaurant personnel (if any), cost of an automobile used in the business (if any) and other discretionary expenditures may significantly affect profits realized in any given operation." See also Maness (1996) on this issue.

regimes. Probably the most famous of these is the case of gasoline retailing. Divorcement laws, which have been passed by a number of state legislatures, usually occur as a result of lobbying on the part of franchised dealers who claim that, when a company acts as both supplier and horizontal competitor, its behavior is influenced by considerations related to downstream competition and foreclosure. They argue that prohibiting company operations will increase competition and yield better outcomes for customers. The empirical literature (e.g., Barron and Umbeck, 1984; Vita, 2000 and Blass and Carlton, 2001) instead has shown that prices are higher when oil companies are prevented from operating stations directly. Similarly, in his study of the effect of state laws protecting the territories of car retailers, Smith II (1982) found that car prices and dealership values rose, while hours of operation fell, after the state laws were enacted. Finally, Slade (1998) examines the forced move that occurred in the UK beer industry from franchising with two-part tariffs to market interaction under linear prices. She finds that draft beer prices rose after brewers were prevented from charging fixed fees.[7]

Though limited, the empirical evidence above has been very consistent in suggesting that differences in organizational form lead to differences in performance. That is, when firms are *required* to use an organizational form *other* than the one they would have chosen, either because of regulatory constraints or because of circumstances for a particular outlet, as in Shelton (1967), authors find differences in prices and other observed outcomes at the outlet level.

The question we address is different, however. Our interest lies in determining whether differences in prices and performance outcomes arise "in equilibrium" when firms are free to choose the ways in which they organize their transactions. The reason this is important in our view is that a mandated organizational form, or an organizational form utilized during a transition

[7] See also Gil, 2010, who shows a statistically significant decrease in the number of movies produced by main studios and their share of the market in the aftermath of the Paramount case. Gil attributes this effect to the prohibition of block-booking that accompanied the requirement that major studios divest their exhibition assets.

period only, by definition will be sub-optimal since the firm's preferred option might not be feasible. But the VCM (vinyl chloride monomer) producers, whose investment behavior Mullainathan and Scharfstein were interested in, were not constrained in any way. Yet the authors found that integrated VCM producers behaved differently, namely their investments in capacity did not respond to changes in market demand like those of non-integrated producers, and they ascribed this difference to the difference in organizational form. Similarly, Gil (2009) finds that movie distributors who own their own exhibition halls keep movies on their screen longer than independent exhibitors do. The question we focus on is why such differences may arise – most importantly, do they arise due to organizational form choices *per se*, or rather due to *other* factors that lead to the decision to vertically integrate? Gil (2009), for example, notes that integrated distributors deal with different types of movies than non-integrated distributors do, and this explained why it was important that they own exhibition capacity. Thus the causality does not go from vertical integration to longer time on screens, but rather from movie type to both vertical integration and longer time on owned screens.

It is of course well known that if market, product or firm characteristics affect the decision to vertically integrate, and the same characteristics affect outcomes, estimates of the relationship between organizational form and outcomes will be biased unless the underlying market and firm characteristics – some of which are likely to be unobserved – are controlled for in the analyses. This is why Shelton's analyses, or those that rely on exogenous changes in law to generate exogenous changes in organizational form, are particularly appealing. But the fact that the organizational forms are not chosen by firms in these cases suggests that observed differences may be due to the inefficiency of the mandated or otherwise non-optimal forms. The question remains

as to whether we should expect to find differences in outcomes that would be caused by organizational form when firms can choose and adjust governance form freely.[8]

Like Shelton, and a few other studies that we mention below, we address this question in the context of franchising. One important advantage of this setting is that most franchisors (70 to 75 %) choose to operate at least some of their outlets corporately, while franchising the others.[9] But the Company whose data we rely on maintains both types of operations over time within each chain. We can therefore examine whether pricing decisions and other outcomes differ between the company operated and franchised outlets of the same chain within the same Company, thereby holding constant many chain- and firm-level policies and related variables that might affect outcomes. In addition, we can avoid self-selection bias – i.e. issues surrounding the decision of which hotels are franchised and company operated – by controlling explicitly for numerous hotel and market characteristics as well as hotel-level unobserved correlated heterogeneity. Finally, we address any potentially remaining identification issues using an instrumental variable approach that we describe further below. But first, we briefly discuss why one might expect differences in outcomes between franchised and corporate units within a chain, and the results of the few studies since Shelton (1967) who have examined this question empirically.

2.2 Franchising versus Company Ownership

There are a number of reasons to expect prices levels and performance to differ between franchised (separated) and company owned (integrated) units of a franchised chain. As is well known, the incentives of hired managers and franchisees, and their objectives, can be very different, leading them to put forth different levels of effort that, in turn, affect quantities and other outcomes. Theories yield different predictions, however, as to the form of pricing and other

[8] For more on the issue of endogeneity in empirical studies of organizational form, see Lafontaine and Slade (2007).
[9] See e.g. Blair and Lafontaine (2005), at 93, where this proportion is 72.5% for mature franchisors.

outcome differences depending on the behavior or outcome of interest, and the specifics of the incentive problem that the theory emphasizes.

The traditional principal-agent model, with its emphasis on the higher-powered incentives of franchisees, suggests that output should be higher, and average variable costs lower, in franchised than in corporately owned and operated outlets. At the same time a franchisee's ownership of its outlet may lead him to free ride on the value of the brand. This could lead to lower quality levels and/or higher prices in franchised outlets, both of which, everything else the same, might result in lower rather than higher output in franchised units.[10] In other words, economic theory leads to different predictions depending on whether the outcome of interest is most affected by the basic incentive issue (too little effort) that is solved by having a franchisee own his outlet, as per the traditional agency model, or by the fact that profit maximizing franchisees *who own their outlet* can increase their individual profits through free-riding.[11]

The outcome variable that has attracted the most attention empirically has been pricing. Many theoretical arguments imply that prices should be higher in franchised outlets.[12] First, contracts written with franchisees are typically more complex and thus costlier to write and enforce than those written with employee managers. This, in turn, might increase costs and prices more generally in franchised units. Second, if outlets have market power, and the franchise contract involves royalty payments, double-marginalization might arise, giving rise to higher prices in franchised than in company owned hotels. Third, the presence of positive spillovers can lead franchisees to choose prices above those that maximize the chain's profits (i.e. prices that would be set in corporate outlets). Finally, a franchisee who successfully increases demand at his

[10] Franchisees also sometimes argue that their franchisor behaves opportunistically towards them. In the hotel industry, one version of this argument is that hotel companies favor corporately owned hotels when tourist agencies or groups make reservations. Everything else the same, this would lead to higher occupancy rates in corporate hotels.
[11] See for example Brickley and Dark (1987), Manolis et al. (1995), Brickley (1999), Lafontaine and Raynaud (2002), and Lafontaine and Shaw (2005) on free-riding and how it affects organizational form decisions in franchised chains.
[12] There is also a sizeable literature in management on differential survival rates between franchised and company-operated or individually owned businesses. See Blair and Lafontaine (2005) for an overview and relevant references.

hotel through higher effort might also price higher as a result.

Of course, it is also true that, depending on the regulatory environment and their preferences, franchisors may be able to, and choose to, impose pricing restraints on franchisees to induce similar prices in both corporate and franchised units.[13]

Shepard (1993) and Hastings (2004) both have examined how price differs between gasoline stations that were franchised versus those that were owned and operated by oil companies in contexts where the companies were not constrained to choose one form of organization or another. Shepard (1993) found that prices of some products were higher in franchised gasoline stations, but Hastings (2004) found no such difference.

Krueger (1991) instead considered how employee pay differs between franchised and company-owned outlets of fast-food chains. He found that employees in company-owned outlets faced steeper earnings profiles than employees in franchised units. He argued that the lower powered incentives of managers in company restaurants made it necessary to offer greater incentives to employees, in the form of efficiency wages and steeper earnings profiles.

Finally, a few authors have looked for evidence of quality differences between the two types of outlets. Bradach (1998: 109) interviewed managers in five fast-food chains, and found that managers "agreed that the two arrangements exhibited similar levels of (standard adherence) uniformity." For the two firms in his sample that used third-party evaluators to assess quality, the average score was 94.6 (out of 100 points) for the franchised units and 93.9 for the company units in the first chain, and 89.7 and 90.6, respectively, for the other. He concluded that there was no quality difference between the two types of units. Using data on quality ratings published by

[13] See Blair and Lafontaine (2005, ch. 7), for a discussion of reasons why prices might differ, and of the regulatory framework surrounding price constraints in franchised chains in the US. Note that most of the studies of pricing differentials in the U.S. have been conducted at a time when the regulatory regime was such that vertical price restraints were treated as "per se" violations of antitrust laws. In our data, the high variation in prices (see Figure A1) and significant differences between average prices of franchised and corporately-owned hotels (Table 3) confirm that the Company was not using such restraining policy either.

Consumer Reports, Michael (2000), on the other hand, found that quality was negatively associated with franchising in both the restaurant and hotel industries, and concluded that free-riding was a problem for franchised chains. Finally, Jin and Leslie (2009) found evidence that hygiene scores (a measure of quality) were higher among company-owned restaurants than among the franchised units of the same chains in their data.

In sum, the evidence remains mixed though suggestive that differences in outcomes such as prices and quality levels or performance may arise "in equilibrium" between the two types of outlets in these chains, and this despite the fact that franchisors choose which outlets to franchise or operate directly, and can modify these decisions over time as well.

3. The Data

We rely on two complementary data sources in this paper. The first is a confidential data set provided by the Company, which includes monthly data on occupancy rates, average room price and total revenues for all the Company's hotels in a particular country. The data cover the period from January 2001 to October 2003, for a total of 34 observations for most of the 1194 hotels in the data.[14] All the hotels are operated under one of the many brands of the Company, with each brand belonging to a quality tier, from budget to luxury hotels. For each hotel, we also know whether it is operated by the franchisor or belongs to a franchisee, and in the latter case, who the franchisee is.[15] A third form of organization used in this industry is also present here: a few hotels are operated under what are called management contracts (see e.g. Kehoe, 1996 on these). In these cases, a third party owns the physical property, but the Company hires managers to

[14] At the time we obtained the data, the Company operated 1305 hotels in this market. One of its smaller brands, however, was fully corporate. We had to eliminate these hotels from our analyses due to perfect failure determination in our first-stage regressions. After this, and removing a few hotels with missing data, our final data set includes information on 1194 hotels.

[15] We only know who owns each hotel at the end of our data period so we can only identify multi-unit ownership on this basis. See section 4.3 for more on this.

operate the hotel under its brand name. Given the Company's full management control and the fact that we have just a few such hotels in the data (48 of them, or 4% of our data), we treat them as Company operated hotels (i.e. the corporate hotels). We have verified that our results are the same if we exclude these from our analyses.

The data also contain information about hotel location. From this, we can assess the distance of the hotel from franchisor headquarters and calculate the number of hotels of the Company (sum over all brands) in a market. Further, since we know the date at which each hotel began its operations, or became part of the Company's hotels, we can also calculate the proportion of the Company's other hotels in the same market as hotel *i* (again sum over all brands) that are franchised. We use these variables as instruments and discuss them further in sections 4.1 and 4.3.

We also know the brand under which each hotel operates, hotel age and size (in number of rooms), and other hotel characteristics, including hotel amenities - e.g. does the hotel offer air conditioned rooms, a fitness facility, a pool, and is there a restaurant, an outdoor café, and so on - as well as specifics of hotel location, in particular whether a hotel is near an airport or a train station (see the data appendix for more details). We include all these as controls in our empirical specifications. Since brands, and the associated customer services, together with hotel amenities, are the major sources of cost differences in the hotel industry, we believe that including brand and amenity fixed effects reliably controls for underlying cost differences among hotels.

In addition, to control for local market characteristics, we obtained government data on population (in 1999), median household income (in 2000) and tourism intensity (in 1998). The tourism intensity data take the form of a monthly indicator on a scale of 0 (none) to 4 (very high) for each local market. Having access to such monthly variation in tourism intensity is a big advantage when analyzing the hotel sector, since it allows us to control for seasonality in local demand as well as unobserved tourist-destination effects that could potentially vary from month to

month. We include this information using a series of dummy variables, one for each level of tourism intensity. To further control for market-level fixed effects, differences in local industry structure and the intensity of competition, we use government data on the total number of hotels (not only the Company's) in each market as of 1998 to construct hotel competition dummy variables. We also use data on the total number of restaurants in each market to construct a set of restaurant competition dummy variables. Since restaurants often compete with hotels for customer expenditure dollars, and for the same labor resources, we view them as complementary goods that may also affect hotel revenues. (See the Data appendix for more details)[16]

Performance in the hotel industry is typically measured either in terms of occupancy rate, or more often in terms of RevPar (revenue per available room) - the key financial measure for the industry, according to the PKF Hospitality Research Company.[17] Unlike room price (or average daily rate), RevPar captures also the level of occupied capacity: it amounts to price multiplied by an average occupancy rate per month, and as such represents a measure of yield.[18] In the end, we focus on three dependent variables in all our analyses, namely occupancy rates, RevPar, and price.

We show descriptive statistics for all the variables above in Table 1, where we treat each hotel as a single observation. Since we have an almost balanced panel, the descriptive statistics are basically the same if we use hotel/months as our observations.[19]

Table 2 shows the same information for different groups of hotels, where we group the company's brands among five main categories based on their prices, from highest to lowest

[16] We prefer these different sets of dummy variables to more traditional geography-based dummy variables as controls for market/location fixed effects in part because we have few hotels in many local markets. As a result, market-specific effects cannot be identified separately from hotel-specific effects. More importantly, we believe that grouping hotel locations according to the level of competition among hotels, and among restaurants, and including information about time-varying tourism intensity and specific characteristics of hotel location (see above), allows us to more flexibly control for market differences pertinent to the hotel industry.

[17] See: http://www.bizjournals.com/triangle/stories/2009/01/26/daily14.html.

[18] Alternatively, RevPar is hotel monthly revenues divided by the number of room/days offered by the hotel that month (i.e. the size of the hotel times the number of days in the month). As we cannot reveal the company name or country, but want to provide some information on the magnitude of the transactions, we have transformed all the financial variables into Euros.

[19] The average number of observations per hotel in our sample is 32.

average price. The data in this table suggests a concave relationship between franchising and price categories/brands, as the group with the lowest average price is least franchised while the group with the highest prices has the second lowest amount of franchising. Interestingly, ordering the brand groups by average RevPar, monthly revenues, average size of hotels, average income in the market, presence of air conditioning, and even hotel density (number of Company's other hotels in the market) exactly follows ordering by price. Other variables also show strong relationships with brand categories but these are not completely monotonic. Average occupancy rates, however, are inversely related to average prices and thus to other variables as well. This data variation across brands is a clear indication that we must control for brand-specific effects in our empirical model if we are to identify performance differences between franchised and non-franchised hotels.

TABLE 1: DESCRIPTIVE STATISTICS, BY HOTEL.

	Mean	**Std. Dev.**	**Minimum**	**Maximum**
Price (Room Rate)	53.67	31.45	20.38	292.54
RevPar	37.23	21.73	10.51	196.79
Occupancy Rate (%)	70.43	10.94	32.25	101.39
Revenues/Month (000's)	172.31	251.47	20.15	3118.99
Number of Rooms	91.24	67.35	29.94	782
Hotel Age	13.41	8.37	1	73.94
Other Hotels in Market [a]	22.19	33.19	0	266
Tourism Intensity	1.71	1.08	0	4
Population	193383	498502.6	192	2125851
Income	9993.03	2110.97	4161.71	23021.63
Franchised	0.34	0.47	0	1
Restaurant on Site	0.44	0.50	0	1
Outdoor Cafe	0.27	0.44	0	1
Air Conditioning	0.47	0.50	0	1
Fitness Facility	0.05	0.23	0	1
Company's Other Hotels in Market: Proportion Franchised	0.17	0.27	0	0.8
Distance from Headquarters	300.55	221.32	0	917.18
Company's Other Hotels in Market: Number	9.37	22.71	1	99

[a] This information is only available for 1015 of the 1194 hotels in our data. The other hotels operate in very large cities, and the government data do not contain this type of variable for very large markets.

TABLE 2: DESCRIPTIVE STATISTICS, PER BRAND GROUP AND HOTEL; MEANS (STANDARD DEVIATION).
(BRAND GROUPS ORDERED BY AVERAGE PRICE OF ROOM FROM THE HIGHEST TO LOWEST).

	Group 1	Group 2	Group 3	Group 4	Group 5
Number of Hotels [b]	152	236	331	193	284
% Franchised	15.33	50.47	51.69	45.45	2.8
	(0.36)	(50.01)	(49.76)	(49.78)	(15.90)
Price (Room Rate)	98.99	77.39	54.10	32.91	23.40
	(42.77)	(19.30)	(8.73)	(4.15)	(1.70)
RevPar	64.82	49.47	39.65	24.89	17.82
	(32.19)	(17.86)	(10.29)	(5.45)	(3.07)
Occupancy Rate (%)	64.09	62.23	72.02	74.95	75.55
	(9.02)	(9.88)	(9.42)	(11.02)	(8.85)
Revenues/Month (000's)	487.47	233.24	153.93	67.37	46.51
	(470.77)	(191.92)	(172.03)	(60.61)	(32.11)
Number of Rooms	140.45	96.63	88.53	75.96	74.17
	(105.95)	(61.27)	(70.39)	(48.59)	(29.83)
Hotel Age	21.81	13.10	14.93	5.7	12.67
	(10.77)	(9.62)	(7.05)	(3.87)	(2.58)
Other Hotels in Market [a]	32.03	34.54	25.68	16.78	8.68
	(40.04)	(43.48)	(32.95)	(28.22)	(13.22)
Tourism Intensity	1.85	1.91	1.86	1.74	1.25
	(1.12)	(1.06)	(1.03)	(1.11)	(0.99)
Population	303405	303613	240994	102683	49352
	(625310)	(628190)	(555206)	(320425)	(191733)
Income	10739	10305	9956	9750	9544
	(2137)	(2267)	(2073)	(2079)	(1879)
Restaurant on Site	0.99	0.68	0.64	0	0
	(0.08)	(0.47)	(0.48)		
Outdoor Cafe	0.11	0.50	0.57	0	0
	(0.31)	(0.50)	(0.50)		
Air Conditioning	0.91	0.79	0.56	0.30	0
	(0.29)	(0.41)	(0.50)	(0.46)	
Fitness Facility	0.22	0.13	0	0	0
	(0.41)	(0.34)			
Company's Other Hotels in	0.18	0.17	0.20	0.17	0.13
Market: Proportion Franchised	(0.20)	(0.20)	(0.22)	(0.23)	(0.22)
Distance from Headquarters	301.87	311.63	300.02	295.99	294.23
	(239.47)	(232.48)	(211.01)	(233.35)	(205.11)
Company's Other Hotels in	14.42	14.23	11.44	5.24	3.02
Market: Number	(28.48)	(28.91)	(25.38)	(14.11)	(8.46)

[a] This information is only available for 1015 of the 1194 hotels in our data. The other hotels operate in very large cities, and the government data do not contain this type of variable for very large markets.

[b] The number of hotels across all brands adds to 1196 rather than 1194 because 2 hotels changed brand during our sample period. In the above statistics we include them in both groups.

Finally, given our interest in performance differences between the two organizational forms, Table 3 compares franchised and corporately run hotels. The results show that price is

higher on average among franchised hotels, while occupancy rates are lower. Both differences are statistically significant, but of opposite signs such that revenues per available room (RevPar) is the same across the two groups. In addition, corporate hotels are much larger (and older) on average. Given no statistical difference in RevPar, it is probably the larger size of corporate hotels that explains the significant difference in total monthly revenues between the two groups. Consistent with the literature on factors that drives the decision to franchise, Table 3 also suggests that on average franchised hotels operate in markets with higher proportion of Company's other franchised hotels, are further away from headquarters and with higher tourism intensity. At the same time, however, the demographic characteristics of the markets - income and population – are not significantly different between the two set of hotels. Contrary to what one might expect from a monitoring perspective, franchised hotels are found in markets where the Company operates larger numbers of hotels. Finally, compared to corporate properties, franchised hotels are more likely to offer amenities such as outdoor cafes or air conditioning but less often fitness facility. However, the last two patterns are likely driven by the large number of corporate hotels in Groups 4 and 5 above, all of which are low price hotels offering almost no amenities and operating in markets where the Company, and other hoteliers as well, operate few hotels.

Though these aggregate data patterns suggest differences in pricing and performance between the two organizational forms, unconditional mean comparisons such as these can be misleading since they do not take into account the potential impact of market or other hotel factors and unobserved hotel heterogeneity that can also lead to different performance levels. The differences in other variables beside our performance measures between the two sets of hotels, as well as differences across brands, clearly show that we need to control for all these other variables, and for brand effects, to correctly identify performance differences due to organizational form *per*

se. We do so via regression analyses in the next section, where we exploit both the within and between-hotel variation in our data (see Figure A1 and the Data Appendix for more details).

TABLE 3: FRANCHISED AND CORPORATELY RUN HOTELS, MEANS (STANDARD DEVIATIONS).

	Franchised: 406 hotels out of 1194=34%	**Corporate:** 788 hotels out of 1194=66%.	**Difference in means significant:** *(10%), ** (5%), *** (1%).
Price (Room Rate)	56.35	52.29	**
	(20.60)	(35.71)	
RevPar	38.60	36.52	
	(15.35)	(24.36)	
Occupancy Rate (%)	68.31	71.52	***
	(11.51)	(10.48)	
Revenues/Month (000's)	126.89	195.71	***
	(100.24)	(298.46)	
Number of Rooms	74.24	100	***
	(36.41)	(77.26)	
Hotel Age	10.25	15.04	***
	(7.92)	(8.13)	
Other Hotels in Market [a]	23.77	21.36	
	(33.51)	(33.01)	
Tourism Intensity	1.92	1.60	***
	(1.00)	(1.11)	
Population	225,612	176,777	
	(564,669)	(460,226)	
Income	9929	10026	
	(2051)	(2141)	
Restaurant on Site	0.46	0.43	
	(0.50)	(0.50)	
Outdoor Cafe	0.40	0.21	***
	(0.49)	(0.41)	
Air Conditioning	0.60	0.41	***
	(0.49)	(0.49)	
Fitness Facility	0.03	0.06	**
	(0.183)	(0.244)	
Company's Other Hotels in Market: Proportion Franchised	0.233	0.138	***
	(0.239)	(0.197)	
Distance from Headquarters	322.06	289.47	**
	(221.64)	(220.47)	
Company's Other Hotels in Market: Number	10.97	8.54	*
	(25.96)	(20.81)	

[a] These data are available only for 1015 of the hotels in our data, out of which 349 are franchised and 666 are corporately operated. The other hotels operate in very large cities, and the government data do not contain this type of variable for very large markets.

4. Methodology and Results

4.1 Baseline Specifications and Results

Our goal is to estimate whether franchised hotels differ, in terms of pricing and performance, from corporate-owned hotels. To do so, we focus on three outcome variables namely: revenues per available room (RevPar in industry jargon), price (room rate), and occupancy rate, and estimate the empirical model of the following general form:

$$Y_{it} = f(F_{it}, X_{it}, Z_i, \varepsilon_{it})$$

where i and t index hotel and months (1 through 34) respectively, Y_{it} stands for the (log) of our outcome variable of interest, F_{it} describes organizational form, where each hotel in a given month can either be franchised (F_{it} =1) or company operated (F_{it} = 0, i.e. control group), X_{it} represents time-varying, and Z_i time-invariant, hotel and market characteristics, including sets of brand, amenity and market-competition (hotels & restaurants) dummy variables. As implied by the data in Tables 2-3 it is important to include all these variables, otherwise our coefficient estimate for the franchise dummy variable would be biased. Moreover, such variables as amenities or brand effects capture major sources of cost differences among hotels, and thus controlling for these allows us to interpret differences in occupancy rates and in RevPar in terms of bottom line performance as well. Finally, we control for changes in aggregate demand over time and other potential shocks common across hotels by including 33 monthly dummy variables.

We assume that $\varepsilon_{it} = \mu_i + u_{it}$ is a composite error term, where μ_i represents hotel-level unobserved heterogeneity that, for now, we treat as being uncorrelated with observed characteristics, and u_{it} is an idiosyncratic error term. In all specifications we control for hotel-level unobserved and uncorrelated heterogeneity (μ_i) either by correcting standard errors for hotel-level

clusters, or by using a random effects specification (RE).[20] Moreover, in all estimations we correct standard errors for (potential) heteroscedasticity using the White/Huber robust estimator of the variance-covariance matrix. All continuous variables enter the regressions in logarithmic form so that the coefficient estimates represent elasticities. This is not only a more flexible functional form, but also reduces the potential impact of outliers or skewed regressors and thus yields more robust coefficients estimates for variables of interest.

The results from estimating the above equation by OLS for our three dependent variables are shown in columns 1, 4 and 7 of Table 4. Consistent with business practice in the hotel industry, we expect hotel management to change prices in reaction to realized occupancy rates in the previous period. Hence, when the dependent variable is price we include the lagged value of occupancy rate (in logs) as an additional control. Similarly for occupancy rates - since customers usually reserve rooms in advance and/or decide whether to stay in a hotel based on their expectations about price or hotel quality, all of which are affected by prices already posted at the time of the reservation – we include the lagged value of price (in logs) as a control variable. Empirically, these lagged values are pre-determined (and thus exogenous) variables, since they are known already when performance outcomes are measured.

One potential concern with our OLS estimation is that some of the unobserved hotel heterogeneity (μ_i), such as, for example, the quality of hotel management, might be correlated with organizational form or other regressors. In that case, OLS results would be biased due to the omission of hotel "fixed effects" and the traditional self-selection problem. To address this issue of possibly *correlated* unobserved hotel heterogeneity (in addition to *uncorrelated* hotel

[20] The difference between clustering in OLS estimations and a random effects specification is that the random effects model imposes an 'equal correlation' structure among hotel observations, while clustering allows for flexible/unstructured correlations. If the 'equal correlation structure' assumption is correct, the RE model provides more efficient estimates, but if not, then the OLS with clustered standard errors estimates are more appropriate. We report results from both specifications in Table 4.

heterogeneity) we follow Mundlak (1978) and include hotel-level means of time-varying regressors as additional controls in our regressions.[21] Specifically, we assume that hotel-level unobserved heterogeneity (μ_i) can be written as:

$$\mu_i = \overline{X}_i \xi + a_i,$$

where $\overline{X}_i$ is the vector of the hotel-level means of all time-varying hotel and market characteristics ($X_{it,\ t=1,..34}$),[22] whereas a_i represents that part of hotel unobserved heterogeneity (in the error term) that is *uncorrelated* with the regressors and that we continue to control for via hotel-level clusters or random effects. We rely on this approach, rather than standard fixed-effects estimation, because while our dependent variables show rich within-hotel monthly variation, our main variable of interest, organizational form, changes little over time.[23] Hence, estimating a fixed-effects model, which amounts to relying on within-hotel time variation only, would prevent us from identifying the impact of organizational form.[24] Modelling hotel unobserved correlated heterogeneity as a function of hotel-level means allows us to introduce some correlation between μ_i and X_i, and thus obtain consistent estimates of the coefficients of interest.[25]

Results from this procedure are also shown in Table 4, in columns 2-3, 5-6, and 8-9.[26] In most cases they are similar to our OLS results in columns 1, 4 and 7, but for some variables the

[21] Mundlak (1978) shows that the results from standard fixed-effects models can be obtained via random effects estimations when firm-level means of time-varying regressors are added as additional controls.
[22] We include the hotel-level means of the following variables: number of rooms, age, and tourism intensity dummy variables, all of which vary over time in our data. When the dependent variable is price (or occupancy rate), we also include the mean of lagged occupancy rate (price). Since other variables do not vary over time within hotels, their means cannot be included.
[23] During our sample period we observe only 11 changes in organizational form.
[24] Wooldridge (1995, and 2002, ch. 15-16) discusses this methodology in the context of controlling for correlated unobserved heterogeneity in non-linear models (Probit/Tobit), where data de-meaning also does not apply.
[25] Note that this approach assumes that observed and unobserved factors are additively separable. Petrin and Train (2006) develop "control function" methods to correct for the endogeneity of prices due to unobserved factors in discrete choice models. While their methods do not require the assumption of additive separability, they show that even when this assumption is rejected, the demand elasticity estimates are very similar between their control function approach and alternative estimators that impose this assumption (including fixed effects). All these estimates, however, differ significantly from the elasticities estimated without any correction for unobservables.
[26] We include the means of time-varying regressors not only in random-effect specifications (as proposed by Mundlak), but also in our OLS estimations with clusters because, as discussed previously, such OLS specifications allow for more robust correlation structures among hotel-level observations.

size or statistical significance of the coefficients changes, pointing out the importance of controlling for unobserved correlated heterogeneity.

TABLE 4: UNBALANCED SAMPLE, FRANCHISE STATUS TREATED AS EXOGENOUS.

	Dep. var= log(RevPar)			Dep. var= log(Price)			Dep. var= log(Occupancy Rate)		
		controlling for hotel unobserved correlated heterogeneity[c]			*controlling for hotel unobserved correlated heterogeneity[c]*			*controlling for hotel unobserved correlated heterogeneity[c]*	
	OLS(cluster)	OLS(cluster)	RE	OLS(cluster)	OLS(cluster)	RE	OLS(cluster)	OLS(cluster)	RE
Franchised	-0.046***	-0.039**	-0.042***	-0.022**	-0.018*	-0.013*	-0.013	-0.007	-0.013
	[0.017]	[0.017]	[0.016]	[0.011]	[0.011]	[0.007]	[0.009]	[0.009]	[0.010]
Lagged Occupancy				0.142***	0.044***	0.043***			
				[0.013]	[0.005]	[0.003]			
Lagged Price							0.306***	0.218***	0.206***
							[0.029]	[0.022]	[0.015]
Number of Rooms	-0.015	-0.268***	-0.266***	0.024	0.002	0.0001	-0.039***	-0.268***	-0.266***
	[0.024]	[0.069]	[0.048]	[0.015]	[0.028]	[0.015]	[0.012]	[0.041]	[0.030]
Hotel Age	0.081***	0.240***	0.222***	0.004	-0.022***	-0.005	0.057***	0.193***	0.168***
	[0.011]	[0.022]	[0.016]	[0.007]	[0.008]	[0.005]	[0.007]	[0.019]	[0.013]
Restaurant on Site	-0.069**	-0.074***	-0.068***	-0.045***	-0.040**	-0.033**	-0.006	-0.010	-0.012
	[0.028]	[0.028]	[0.026]	[0.017]	[0.017]	[0.015]	[0.015]	[0.015]	[0.015]
Air Conditioning	0.103***	0.100***	0.087***	0.067***	0.064***	0.067***	0.013	0.006	-0.0004
	[0.020]	[0.020]	[0.021]	[0.012]	[0.011]	[0.012]	[0.011]	[0.011]	[0.012]
Outdoor Cafe	0.042*	0.043*	0.036	0.02	0.018	0.003	0.011	0.010	0.014
	[0.024]	[0.024]	[0.023]	[0.015]	[0.015]	[0.014]	[0.014]	[0.013]	[0.013]
Fitness Facility	0.145***	0.144***	0.152***	0.053*	0.037	0.046	0.058**	0.059**	0.066**
	[0.044]	[0.044]	[0.048]	[0.032]	[0.032]	[0.030]	[0.024]	[0.023]	[0.027]
Population	0.049***	0.044***	0.047***	0.020***	0.018***	0.017***	0.017***	0.011***	0.014***
	[0.007]	[0.007]	[0.007]	[0.005]	[0.005]	[0.005]	[0.004]	[0.004]	[0.004]
Income	0.243***	0.260***	0.255***	0.169***	0.154***	0.162***	0.006	0.018	0.016
	[0.031]	[0.032]	[0.032]	[0.019]	[0.018]	[0.018]	[0.020]	[0.021]	[0.019]
Tourism Intensity =1	0.004	0.051***	0.050***	0.014**	0.017***	0.017***	-0.015*	0.026***	0.025***
	[0.012]	[0.011]	[0.005]	[0.006]	[0.003]	[0.002]	[0.009]	[0.009]	[0.004]
Tourism Intensity =2	0.039***	0.138***	0.137***	0.027***	0.038***	0.039***	-0.001	0.080***	0.079***
	[0.014]	[0.015]	[0.006]	[0.007]	[0.004]	[0.002]	[0.010]	[0.011]	[0.005]
Tourism Intensity =3	0.171***	0.339***	0.338***	0.067***	0.089***	0.090***	0.061***	0.209***	0.208***
	[0.018]	[0.020]	[0.007]	[0.010]	[0.006]	[0.003]	[0.012]	[0.014]	[0.006]
Tourism Intensity =4	0.207***	0.411***	0.410***	0.103***	0.114***	0.115***	0.060***	0.257***	0.255***
	[0.023]	[0.027]	[0.010]	[0.013]	[0.009]	[0.004]	[0.013]	[0.019]	[0.008]
Constant	0.276	0.177	0.262	0.988***	0.458**	0.584***	3.091***	2.900***	3.000***
	[0.318]	[0.327]	[0.338]	[0.185]	[0.197]	[0.212]	[0.186]	[0.198]	[0.191]
Brand Fixed Effects	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***
Observations	39226	39226	39226	37936	37936	37936	37936	37936	37936
# of Hotels	1194	1194	1194	1194	1194	1194	1194	1194	1194
R2	0.74	0.75	0.85	0.93	0.93	0.93	0.42	0.44	0.48

Notes: Robust standard errors in brackets. If 'cluster' appears in the title, the standard errors are corrected not only for heteroscedasticity, but also for correlation within hotels. Significant at: * 10%; ** 5%; *** 1%.

All specifications include 33 month dummy variables, 9 hotel competition and 5 local restaurant competition intensity dummy variables, as well as *dummy variables for other hotel characteristics,* namely presence of rental car counter, swimming pool, or conference room, and proximity to airport and to train station. For tourism intensity, the lowest level (=0) represents the omitted category.
[a]We control for hotel unobserved correlated heterogeneity by modeling it as a function of the hotel level means of the following variables: number of rooms, age, and tourism intensity dummy variables. In addition, when the dependent variable is price (or occupancy rate), we include the mean of lagged occupancy rate (price).

Overall, results in Table 4 are quite consistent when it comes to differences in outcomes between the two organizational forms. They imply that franchisees charge lower prices but obtain similar occupancy rates as corporate hotels. This, in turn, leads to lower revenues per available room among franchised hotels, as per the first three columns of Table 4.[27] This result is interesting as several arguments in the literature, including double marginalization and the positive spillover argument, imply that franchisees should price higher than corporate units of the same chain. The evidence to date, which comes mostly from fast-food and gasoline retailing, moreover suggests that prices are indeed higher in franchised units.[28]

But while the impact of the franchising dummy variable on prices and RevPar is negative and statistically significant in all specifications in Table 4, the differences implied by the estimates are economically quite small, especially compared to the effect of many hotel or market characteristics. For instance, the presence of air conditioning at a hotel has three to four times the effect (in absolute value) on prices, and two to three times the effect on RevPar, compared to what we find for whether hotel is franchised or not. Specifically, while being franchised reduces RevPar on average by around 4% and prices by 1-2% compared to corporate hotels, offering air conditioning increases RevPar by about 10% and prices by about 6-7%. Similarly, the coefficients of the tourism intensity dummy variables – which increase as one moves from the lowest intensity (= 0, the control group) to very high intensity (= 4) – show that seasonal demand changes have

[27] Since including the lag of price (occupancy rate) when the dependent variable is occupancy rate (price) reduces the sample compared to when we use RevPar, we re-estimated the results for RevPar using the reduced sample of 37936 observations. The results were consistent with those reported here.
[28] See notably Barron and Umbeck (1984), Shepard (1993) and Graddy (1997).

much larger impacts, on all three outcome measures, than does organizational form, especially when controlling for hotel-level correlated heterogeneity. Indeed, whether the hotel experiences very high (= 4) vs. almost no (= 0) tourism intensity in a given month generates differences in all three outcomes at least 10 times larger (cols. 2-3, 5-6 and 8-9) than those we find for whether the hotel is franchised or not.

Turning to the effect of lagged occupancy rate in columns 4 to 6, we find, as expected, that hotels increase prices when they experience high occupancy rates in the previous period. These effects are smaller when we control for hotel-level correlated heterogeneity in columns 5 and 6. Still, a 10% increase in occupancy rate one period – which in our sample corresponds to a 7 percentage point increase given a mean occupancy rate of 70% - is associated with a 0.4% rise in price the next period. Similarly, a high price in the last period is associated with a sizable increase in current occupancy rate as shown in columns 7 to 9. In general, the effect of lagged occupancy rates and prices support our previous arguments on the importance of past information for both managers and customers in this industry.

Finally, we find evidence that older hotels have higher occupancy rates, and higher RevPar, while larger hotels have lower occupancy rates and RevPar. In particular, estimated coefficients (elasticities) suggest that increasing hotel capacity by 1% (which, given the mean size of hotels in our data, corresponds to an increase of roughly 1 room) reduces both occupancy rate and RevPar by about 0.27%. Similarly, increasing hotel age by 10% (about 1.3 years given our sample mean of 13. 4 years) leads to a 2.2 to 2.4% increase in RevPar, and a 1.7 to 1.9% increase in occupancy rate, on average. Not surprisingly, hotels offering more amenities, such as air-conditioning or fitness facilities, or those in high-population and high-income areas, command higher prices and obtain higher RevPar.

While the regression analyses above control for many observed hotel and market characteristics, as well as unobserved hotel characteristics, it remains that our approach may not control for all potential sources of correlation between the idiosyncratic shock (u_{it}) and organizational form. In particular, it is possible that hotel-specific demand or supply shocks (e.g. a hotel goes through major re-modelling) that we do not observe in the data, and changes over time in unobserved hotel-level characteristics (e.g. change in management personnel) will be correlated with both performance and organizational form, thereby still biasing our coefficients of interest.[29] For this reason, in Table 5, we present results obtained when we endogenize organizational form and estimate the performance equation using an instrumental variable (IV) methodology.[30]

We rely on the proportion of the Company's other hotels that are franchised, in the same market in any given month, as our main instrument. This variable affects the Company's monitoring costs locally, and thus should influence the choice of organizational form for hotel *i*. Prior research has shown that franchising tends to be used to operate in more rural, farther away markets that are also often less familiar to a franchisor because of different demographics (e.g. presence of certain ethnic groups), regulations (e.g. different tax laws across jurisdictions), culture (e.g. need for second language in certain areas) and so on.[31] Our data on average distance to headquarters in Table 3 further supports this contention. In further away markets, then, local franchisees can help a franchisor overcome this lack of familiarity and better adjust to the local

[29] For example, if the Company ran a promotion for hotels in a certain region, many of which turned out to be franchised, for several months during our sample period, this could affect the performance of many franchised hotels and thus bias the coefficient on the franchising dummy variable upward. Indeed, this might explain why e.g. Ciliberto (2006) finds a significant impact of organizational form changes on service provision and investments in the hospital industry. In his study, the changes in organizational form were triggered by more fundamental changes in the market for hospital services - in particular health care system reorganization. These however should not only cause changes in organizational form but they should also affect performance directly.

[30] Our goal is to correct for what is called the "endogenous dummy variable" problem. As discussed in Heckman (1978, 1990) and Wooldridge (2002, p. 622), we can estimate our performance equation by standard 2SLS (or IV) using a linear probability model for the first stage.

[31] See Lafontaine and Slade (2007) for a review of the empirical literature on the incidence of franchising.

market.[32] However, franchisees need assistance and oversight from franchise field consultants. When a firm has several other franchised businesses in a local market, it is easier to provide such support to yet another franchised unit in the same market. In fact, Kalnins and Lafontaine (2004) show that franchisors cluster the units of their franchisees geographically. Similarly, and for similar reasons according to Kalnins and Lafontaine, corporate units tend to be clustered. Hence the proportion of other franchised hotels in a region should be highly correlated with the organizational choice for a given hotel.

The extent of franchising for the other hotels in the Company is a valid instrument not only because it affects the decision to franchise a hotel locally, as argued above, but also because it does *not* affect performance of a specific hotel *directly*. There are several reasons for this. First, this characteristic does not affect a hotel's operating costs in the market. Second, on the demand side, customers rarely are aware or mindful of whether a hotel is corporate or franchised, so it is very unlikely that the extent of franchising of local hotels – and specifically the extent of franchising among those operated by a given Company – will affect demand at the focal hotel. Third, given that hotel ownership does not enter customers' preferences for rooms, there is no reason to expect that a manager at hotel *i* would/should react differently to the competitive threat posed by franchised and corporately owned hotels in his/her market. This again is especially true given that the proportion of franchised hotels, as we measure it, is averaged across *all* the brands and chains of the Company in the market, and we already control for various market and hotel characteristics that may affect hotel performance directly and for unobserved hotel heterogeneity as well.[33] Finally, Lafontaine and Shaw (2005) discuss how franchisors target a stable mix of

[32] See e.g. Cox and Mason (2007) for more discussion.

[33] In some cases of multi-unit ownership (an issue we discuss further below, in Section 4.3), a single franchisee may own many hotels in a local market. Thomadsen (2005) finds evidence that such franchisees may be able to price higher due to their local market power. However, our instrument represents the average proportion of franchised outlets across all the chains and brands of the Company in the market, and as such, it is different from, and unlikely to be affected by, the number of outlets of any multi-unit owner. Moreover, we already control for the potential market

franchised vs. company-owned units in the long run.[34] While a target level of franchising is a corporate- or Company-level decision affecting the likelihood that a given hotel is franchised or not (given the proportion of other hotels already franchised in the market), hotel prices and performance are individual business-unit outcomes and thus depend on hotel-level decisions.

To fully control for both correlated and uncorrelated unobserved hotel heterogeneity in our IV estimations, we again model *correlated* heterogeneity as a function of hotel level means as described above. We address the issue of *uncorrelated* heterogeneity by correcting standard errors for hotel-level clusters given that results in Table 4 were similar for random effects and OLS with clusters, but the latter allow more flexible correlation structures among observations.[35]

Table A1, in the appendix, shows first-stage regression results for all three dependent variables. We find that the instrument always has a positive and significant – at 1% – effect, on the probability that a hotel is franchised, as expected. At the means, the probability of an outlet being franchised increases by 9% for a one standard deviation increase (0.27) in the proportion of other hotels of the Company that are franchised in the local market. The first-stage F-statistic, at around 34 in all regressions, is much larger than the critical value of 10 needed to satisfy the "weak instrument" test suggested by Staiger and Stock (1997), a test that Stock and Yogo (2002) further confirm provides a safe threshold especially in the case of one endogenous variable and one (or two) instrument(s), as we have here.[36]

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power of a franchisee that could also affect hotel performance via our controls for correlated unobserved hotel heterogeneity (i.e. "hotel fixed effects").

[34] For example, Accor North America - one of the largest hotel companies – recently announced the opening of 57 new hotels in North America, including 51 franchised and 6 company owned properties. According to Olivier Poirot, the CEO: "Our growth plans in North America are consistent with Accor's philosophy to maintain balance as an owner/operator, management partner and franchisor…By increasing the growth of both franchised and corporately-owned locations in our network, Accor is getting closer to achieving our goal of reaching 1,200 North American properties by 2010" (HNN Hotelnewsnow.com. 2009).

[35] The clustering also helps avoid potential underestimation of standard errors that can result from the repetition of time invariant variables within hotel. See Moulton (1990) for more details.

[36] Murray (2006) further points out that when instruments are weak, the estimated standard errors in 2SLS are too small and thus null hypotheses are too often rejected. However, when the Stock and Yogo (2005) test rejects the null hypothesis of weak IV, inferences based on 2SLS estimates and standard errors should be valid. Murray further

Once we endogenize the organizational form decision, in Table 5, we find that the effect of the franchising dummy variable is not only economically small, but that it becomes statistically insignificant. The estimated coefficients for other variables, on the other hand, remain very similar to those we obtained under OLS (cluster) and RE estimates in Table 4. We conclude that the positive difference in prices for franchised hotels, for example, found in our descriptive statistics, which had become small but negative after we addressed omitted variable bias via controls for hotel and market characteristics, observed and unobserved, in Table 4, is statistically as well as economically insignificant when we endogenize organizational form. In other words, the small differences between franchised and corporate hotels we found in Table 4 were not due to franchising per se, but rather reflected remaining endogeneity bias likely due to correlation between unobserved time-varying market or hotel variables and organizational form choice.

We view our results as evidence that in contexts where firms are free to choose to organize their transactions as they see fit - based on observed and unobserved market and firm characteristics - organizational form itself does not lead to significant differences in prices or performance.[37] This result is perhaps to be expected when a firm that would find, for example, that prices are too high or revenues too low in any of its franchised outlets could remedy this situation by choosing to buy back the property and operate the outlet corporately instead. Indeed, in the hotel industry, franchise companies can (and do) terminate franchise contract during the contract period if the franchisee underperforms or more specifically does not satisfy the quality required by the brand.[38] The fact that we see few changes in organizational form during the almost three-year

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suggests a rule of thumb to verify that 2SLS estimates are more reliable than OLS estimates in small samples. He proposes that the number of observations multiplied by R^2 from the first stage (0.43 in our case, see Table A1) should be larger than the number of instruments. This condition is clearly satisfied here, even if we use the number of hotels (i.e. clusters) instead of the number of observations in our data.

[37] Shaver (1998) similarly finds that once endogenized, organizational form - in his case the mode of entry choice between greenfield versus acquisition – has no effect on subsidiary survival.

[38] For more details on early termination of franchise contract, see: Hotel & Motel Management (2008), HNN Hotelnewsnow.com. (2009) and (http://business-law.freeadvice.com/ franchise_law/agreement_terminated.htm).

period of our data suggests that the Company is rather satisfied with the results it obtains under its current set of organizational choices.

TABLE 5: IV ESTIMATIONS, FRANCHISE STATUS TREATED AS ENDOGENOUS.
UNBALANCED SAMPLE; ALL SPECIFICATIONS CONTROL FOR HOTEL UNOBSERVED CORRELATED HETEROGENEITY.

Dependent Variable	log(RevPar)	log(Price)	log(Occupancy Rate)
Franchised	-0.085	0.031	-0.077
	[0.093]	[0.054]	[0.054]
Lagged Occupancy		0.044***	
		[0.005]	
Lagged Price			0.217***
			[0.022]
Number of Rooms	-0.268***	0.003	-0.268***
	[0.069]	[0.028]	[0.041]
Hotel Age	0.240***	-0.021***	0.192***
	[0.022]	[0.008]	[0.019]
Restaurant on Site	-0.084**	-0.029	-0.027
	[0.035]	[0.020]	[0.021]
Air Conditioning	0.104***	0.059***	0.014
	[0.021]	[0.012]	[0.012]
Outdoor Cafe	0.043*	0.017	0.011
	[0.024]	[0.015]	[0.014]
Fitness Facility	0.135***	0.046	0.047*
	[0.046]	[0.033]	[0.026]
Population	0.045***	0.017***	0.012***
	[0.007]	[0.005]	[0.004]
Income	0.259***	0.155***	0.019
	[0.032]	[0.018]	[0.020]
Tourism Intensity =1	0.051***	0.017***	0.026***
	[0.011]	[0.003]	[0.009]
Tourism Intensity =2	0.138***	0.038***	0.081***
	[0.015]	[0.004]	[0.011]
Tourism Intensity =3	0.339***	0.089***	0.209***
	[0.020]	[0.006]	[0.014]
Tourism Intensity =4	0.411***	0.114***	0.257***
	[0.026]	[0.009]	[0.019]
Constant	0.265	0.347	3.053***
	[0.361]	[0.225]	[0.231]
Brand Fixed Effects	Yes**	Yes**	Yes**
Observations	39226	37936	37936
# of Hotels (clusters)	1194	1194	1194

Notes: In all specifications, standard errors –in brackets - are corrected for heteroscedasticity and hotel-level clusters. Significant at: * 10%; ** 5%; *** 1%.
All specifications include 33 month dummy variables, *9 hotel competition and 5 local restaurant competition intensity dummy variables*, as well as *dummy variables for other hotel characteristics*, namely presence of rental car counter, swimming pool, or conference room, and proximity to airport and to train station. For tourism intensity, the lowest level (=0) represents the omitted category.
We control for hotel unobserved correlated heterogeneity by modelling it as a function of the hotel level means of the following variables: number of rooms, age, and tourism intensity dummy variables. In addition, when the dependent variable is price (or occupancy rate), we include the mean of lagged occupancy rate (price).

In what follows, we verify the robustness of our results across several alternative specifications, starting with potential non-linear effects of organizational form.

4.2 Testing for Non-linear Effects of Organizational Form

We have looked, so far, for performance differences only in the form of intercept shifts. In this section, we relax our empirical specification to consider the possibility that performance differences between franchised and corporate hotels might depend on other variables as well. We focus on hotel age and size (number of rooms) in part because our data in Table 3 suggests that franchised and corporate hotels are indeed quite different along these dimensions. From a theory perspective, the performance difference between franchised and corporate hotels might increase with hotel age as the franchisee gets more experience and the hotel becomes better established in the market. Moreover, franchisors often highlight the franchisee's long-term involvement in the business as a main benefit of franchising, when compared to the typically much shorter tenure of company managers at any given property. If franchising leads to more stable management at the hotel and such stability is beneficial, then again the performance difference between franchised and corporate hotels would increase with hotel age. Similarly, performance differences between franchised and corporate hotels may increase or decrease with hotel size. For example, agency theory suggests that franchisees, as local owners, should be better at overseeing staff and managing related issues, which could be more problematic in larger hotels. Some literature suggests that firms tend to franchise smaller rather than larger outlets.[39] As Table 3 shows, our data also follow this pattern: on average, franchised hotels are significantly smaller (by about 25 rooms) than corporate hotels. They also tend to be younger (about 5 years).

[39] See Lafontaine and Slade (2007).

TABLE 6: TESTING FOR NON-LINEAR IMPACTS OF ORGANIZATIONAL FORM

Dependent Variable	log(RevPar)		log(Price)		log(Occupancy Rate)	
Franchised	0.027	0.956	0.060	0.974	-0.054	-0.373
	[0.176]	[1.260]	[0.106]	[0.860]	[0.123]	[0.700]
Franchised *Age	-0.050		-0.013		-0.01	
	[0.078]		[0.047]		[0.052]	
Franchised*Size		-0.242		-0.219		0.069
		[0.293]		[0.202]		[0.162]
Lagged Occupancy			0.044***	0.044***		
			[0.005]	[0.006]		
Lagged Price					0.218***	0.217***
					[0.022]	[0.022]
Number of Rooms (Size)	-0.259***	-0.078	0.005	0.186	-0.266***	-0.326**
	[0.070]	[0.239]	[0.029]	[0.171]	[0.042]	[0.142]
Hotel Age	0.278***	0.243***	-0.011	-0.018**	0.199***	0.191***
	[0.064]	[0.023]	[0.037]	[0.009]	[0.045]	[0.020]
Restaurant on Site	-0.089**	-0.079**	-0.030	-0.024	-0.028	-0.028
	[0.038]	[0.037]	[0.021]	[0.022]	[0.022]	[0.022]
Air Conditioning	0.107***	0.113***	0.060***	0.067***	0.014	0.011
	[0.022]	[0.024]	[0.013]	[0.016]	[0.013]	[0.013]
Outdoor Cafe	0.045*	0.047*	0.018	0.021	0.011	0.01
	[0.024]	[0.025]	[0.015]	[0.017]	[0.014]	[0.014]
Fitness Facility	0.146***	0.125**	0.048	0.037	0.049*	0.050*
	[0.048]	[0.050]	[0.035]	[0.037]	[0.028]	[0.027]
Population	0.044***	0.045***	0.017***	0.018***	0.012***	0.012***
	[0.007]	[0.008]	[0.005]	[0.005]	[0.004]	[0.004]
Income	0.254***	0.257***	0.154***	0.154***	0.018	0.019
	[0.033]	[0.033]	[0.019]	[0.020]	[0.021]	[0.021]
Tourism Intensity =1	0.051***	0.051***	0.017***	0.017***	0.026***	0.026***
	[0.011]	[0.011]	[0.003]	[0.003]	[0.009]	[0.009]
Tourism Intensity =2	0.138***	0.138***	0.038***	0.038***	0.081***	0.081***
	[0.015]	[0.015]	[0.004]	[0.004]	[0.011]	[0.011]
Tourism Intensity =3	0.339***	0.339***	0.089***	0.089***	0.209***	0.209***
	[0.020]	[0.020]	[0.006]	[0.006]	[0.014]	[0.014]
Tourism Intensity =4	0.412***	0.411***	0.114***	0.114***	0.257***	0.257***
	[0.027]	[0.026]	[0.009]	[0.009]	[0.019]	[0.019]
Constant	0.249	-0.051	0.336	0.087	3.051***	3.143***
	[0.364]	[0.547]	[0.223]	[0.322]	[0.231]	[0.308]
Brand Fixed Effects	Yes**	Yes**	Yes**	Yes**	Yes**	Yes**
Observations	39226	39226	37936	37936	37936	37936
# of Hotels (clusters)	1194	1194	1194	1194	1194	1194

Notes: See Table 5.

To see how performance differences relate to hotel age and size, we include cross-effects between the franchising dummy variable and hotel age and size, respectively, in our performance equations.[40] Since organizational form is an endogenous variable, the cross-effects are also

[40] We also experimented with cross effects between the franchise dummy and population or income to see whether responses to organizational form may vary with demographic characteristics of the market. However, corporate and

endogenous, so we include only one cross-effect at a time, and rely on two instruments, namely our previous instrument (the proportion of the Company's other hotels in the market that are franchised) and its cross effect with age or size. Though not shown, the instruments were jointly significant at 1% in all first-stage regressions.[41] The results in Table 6 show that neither franchising dummy nor its cross-effects are significant. Hence we find no evidence that the impact of organizational form on performance or prices varies with hotel size or age, or that controlling for such cross-effects alters our previous results of no performance differences between the two organizational forms.[42]

4.3 Other Robustness Analyses

Balanced sample

Though we have observations for 34 months for most of the hotels in our sample, there are 122 hotels for which the time series are incomplete, and in some cases the number of observations is as small as three. To verify that the presence of hotels with such short time series does not affect our results, we replicated Tables 4 and 5 for the sub-sample of 1072 hotels with full time-series data. The results, in Appendix Tables A2 and A3, confirm that our conclusions are not affected by the presence or absence of these few hotels.

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franchised hotels are found in markets with very similar population and income levels (see Table 3). Since we also have no time variation in our demographic data, the correlations between the franchise dummy and its cross-effect with log(population) and log(income) were 0.98 and 0.99 respectively. Consequently, we could not reliably identify separate effects for these.

[41] The F-statistics in all first-stage regressions were also much larger than the critical value suggested by Stock and Yogo (2002, Table 1), for the case of two endogenous variables and four instruments (F=11.04). Though the critical values for our case (two endogenous variables and two instruments) are not tabulated, the critical values increase with the number of instruments so we can infer that our results pass their test. First-stage results are available on request.

[42] When we include the cross effects with size (col. 2, 4, 6) the coefficient of franchising dummy becomes noticeably larger, which given the strong statistical properties of our instruments, is likely due to the high correlation between the franchising dummy and its cross-effect with size rather than to weak instruments.

Brand sub-samples

Though all our regressions above include brand dummy variables to control for differences between brands, Table 2 also shows that there is noticeable variation within brands. One might therefore expect that performance differences due to organizational form and the effect of other variables might be different for the different brands. To address this issue we replicated our IV estimations for all three dependent variables separately for each of the five brand-groups in Table 2 (the results are not shown for space reasons). Despite much smaller sample sizes, these results once again supported our conclusion of no significant performance or price differences between franchised and corporate hotels. Additionally, we found the impact of other variables in these regressions also to be quite consistent with the results in Table 5.

Total hotel revenues per month as a dependent variable

As discussed earlier, RevPar is a standard measure used to assess hotel performance in the industry. However, since it is a construct (price multiplied by occupancy rate) rather than a direct measure of hotel outcome, we re-estimated our performance equation using hotel monthly revenues as the outcome measure.[43] The results (not shown) confirmed our previous findings that franchised hotels on average do not show significantly different monthly revenues compared to corporately-owned hotels.

Controlling for multi-unit ownership among franchised hotels

Some studies in the franchising literature examine how multiple-unit ownership by franchisees can alter the effect of franchising on performance (e.g. Brickley, 1999; Kalnins and Lafontaine, 2004, Thomadsen, 2005). These suggest that franchisees with a higher number of franchised units may not be able to monitor manager behavior in these units much better than the

[43] In our data, this variable was not exactly equal to: RevPar * number of rooms* number of days in a month. This is because the hotel can be closed for a few days, or some subset of rooms may be unavailable at a given point in time. Unfortunately, we do not have this kind of information in our data. In that sense RevPar is in fact a better measure.

franchisor can. This in turn could lead to worse outcomes for franchised units, and bias downward our estimates of differences between franchised and corporate hotels. Alternatively, franchisees with numerous outlets may be able to exercise some market power, biasing the effect of franchising upward in our performance regressions. Though correcting for hotel unobserved heterogeneity generally addresses these issues, we also re-estimated all regressions controlling for multi-unit ownership as captured by the number of other hotels of the Company that a franchisee owns (calculated across all the company's brands).[44] These analyses again confirmed our findings: across all the specifications for both balanced and unbalanced data, we found that multi-unit ownership had no significant impact on performance and, as such, its absence in our main specifications did not bias our results.

Using alternative instruments for organizational form

To further verify the robustness of our IV results, we explored alternative measures for monitoring costs as instruments, namely the log of the number of hotels of the Company in the market, and the log Distance of the hotel to Company Headquarters.[45] If monitoring costs are reduced for hotels located in markets where the firm operates many other hotels because it is easy to find a company representative to one more, nearby location, to monitor operations, then it should be less problematic to operate more hotels corporately in such markets.[46] In addition, agency theory suggests that larger Distance to Company's Headquarters should increase the need for franchising, because the costs of monitoring further away outlets are greater, and franchisees

[44] Recall that we only observe ownership at the end of our data period, so this variable is constant over time for a given franchisee and all their hotels. We can nonetheless include this variable in our regressions when we control for unobserved correlated hotel heterogeneity using Mundlak (1978)'s approach.

[45] Note that this count is for the entire sample period. When we used number of Company's hotels per month instead, the results were very similar.

[46] Alternatively, the firm might experiment in new markets with corporately-run hotels and then sell the established hotels to franchisees. In this case, we should find a positive correlation between the number of hotels of the Company in the market and franchising. Whether the number of Company hotels in the end increases or decreases the likelihood of franchising, there are theoretical arguments to support using this variable as an instrument for organizational form.

are expected to outperform company operations in more distant markets since they know the local market better and can thus better respond to customer needs.[47]

We believe that both of these variables can be excluded from our performance equation because we already control for various market and hotel characteristics that may affect performance *directly* via our numerous control variables, including brand, competition and monthly dummy variables, and via unobserved hotel heterogeneity controls.[48]

Since both instruments rely primarily on across-market (as opposed to between or within-hotel) variation, we include them together in our first-stage regressions. We find that both are significant in all first-stage regressions (results available on request). The second-stage results, summarized in Table A4, again confirm our previous findings: once we endogenize organizational form, franchising does not lead to significant differences in pricing or performance.[49]

Excluding outliers

To avoid the possibility that our results might be driven by particularly large – and thus potentially erroneous - values for our dependent variables, we replicated Table 5 while removing from our sample all observations where a dependent variable was greater than the 95th percentile. The results were very similar to those we report, and the franchising dummy variable continued to have no significant impact on any of the dependent variables.

Quantile Regressions

[47] See Lafontaine and Slade (2007) for a survey of evidence on franchising which shows that more geographically dispersed franchised chains tend to use franchising more. Also, see Kalnins and Lafontaine (2010) for evidence that distance from monitoring headquarters reduces the survival of business outlets. One way to counter this effect is to franchise further away units, thereby effectively reducing the distance between owner headquarter and the outlet.
[48] Note that the company's headquarter is located in a large city that is a major tourist destination. Thus one may argue that hotels near headquarters might have better outcomes on average for this reason. However, we control for tourism intensity *directly* via our tourism intensity dummies, as well as via our controls for hotel unobserved heterogeneity.
[49] When we used hotel density and distance to headquarters separately as instruments, our main conclusions did not change, but the estimated coefficients of the franchising dummy variable were noisier.

We explore further the impact of organizational form on performance using quantile regressions. Unlike OLS or IV estimation, both of which focus on predicting means, quantile regressions rely on minimizing absolute deviations and enable us to identify differences in outcomes between franchised and corporate hotels at different parts of the distribution. This type of analysis is of interest not only as an additional robustness check for our previous mean-focused analyses, since quantile regressions are less susceptible to outliers, but also because risk or uncertainty and thus higher/lower variation in outcomes may give rise to different responses to organizational form. In particular, the data in Table 3 suggest that while corporate hotels experience higher variation in prices and RevPar, franchised hotels seem to experience slightly higher variation in occupancy rates.[50]

We estimate our baseline specification (controlling for hotel correlated unobserved heterogeneity but treating franchising as exogenous) for three quantiles: 25th, 50th (median) and 75th percentile.[51] In these regressions, the coefficients of the franchising dummy variable do not reflect the average/mean differences between franchised and corporate hotels in our outcome measures, but differences in medians, 25th and 75th percentiles between the two groups of hotels. Also, to account for possible cross-correlations in standard errors across quantiles and thus obtain more robust results, we estimate the impacts on all three quantiles simultaneously and use bootstrap resampling to estimate the variance-covariance matrix. [52] We use 100 replications for occupancy and price but, due to convergence problems, only 50 replications for RevPar.

Results, in Table 7, again support our earlier conclusions, namely that the differences in performance and pricing attributable to franchising as organizational form are either statistically

[50] We thank to anonymous referee for this suggestion.
[51] As mentioned by Chernozhukov and Hansen (2006), practical estimation and inference methods for instrumental quantile regressions are complex and currently still being explored. At the same time, treating the franchising dummy variable as exogenous ensures that our quantile results are not driven solely by the nature of instruments.
[52] Given the panel nature of our data it can easily happen that the outcome values for the same hotel would cross boundaries of different quantiles in different months.

insignificant or, if they are significant at some percentiles, the effects are economically very small - even smaller than those we found in our OLS estimations (Table 4). Specifically, for prices, we find that the coefficient of the franchising dummy variable is significant only for the 75th percentile, and the size of this coefficient implies that the price of a franchised hotel at the 75th percentile is 0.7% lower than the price of a corporate hotel at 75th percentile. This represents a difference about 0.49 euros (at 70.14 value for the 75th quantile in our sample). Meanwhile, OLS estimates suggested about a 2% difference (or 1.07 euros) at the mean (53.67).

At the same time, as before, we also find that whether a hotel has a fitness facility or faces high tourism intensity, for example, generates a 9% (i.e. more than 10-times larger) positive difference in prices. In other words, the presence of a fitness room in a franchised hotel at the 75th percentile more than outweighs any agency effect on price. For occupancy rates, the most sensitive to franchising seems to be the lowest 25th percentile. But even among the set of least occupied hotels, franchised hotels show only about 1% lower occupancy rates than corporate hotels, compared to the 60.6% occupancy rate for the 25th percentile in our sample. Finally, although RevPar seems most sensitive to organizational form, we should mention that the standard errors for this outcome might be underestimated as we were unable to complete more than 50 bootstrap replications.[53] Nonetheless, assuming that the estimated coefficients would remain significant, they would imply negative differences for franchised hotels of between 1-3% for RevPar at the highest to lowest quantile, respectively. This again is a slightly smaller impact than the mean-difference, about 4%, suggested by our OLS results; and much smaller impacts on performance once again when compared to that of other hotel or market characteristics.

[53]Though 20 replications should be generally sufficient for hypothesis testing (as noted in STATA's statistical manual, v.11), raising the number of bootstrap replications from 50 to 100 for price and occupancy rate led to slightly higher standard errors for the franchised dummy variable, suggesting some underestimation bias with smaller numbers of replications.

TABLE 7: QUANTILE REGRESSIONS - FRANCHISE STATUS TREATED AS EXOGENOUS. UNBALANCED SAMPLE; ALL SPECIFICATIONS CONTROL FOR HOTEL UNOBSERVED CORRELATED HETEROGENEITY.

	Dep. var= log(RevPar)			Dep. var= log(Price)			Dep. var= log(Occupancy Rate)		
	q25	q50	q75	q25	q50	q75	q25	q50	q75
Franchised	-0.031***	-0.021***	-0.013***	-0.003	-0.003	-0.007***	-0.011***	-0.005	0.004*
	[0.005]	[0.005]	[0.005]	[0.002]	[0.002]	[0.002]	[0.004]	[0.003]	[0.002]
Lagged Occupancy				0.033***	0.045***	0.040***			
				[0.005]	[0.004]	[0.005]			
Lagged Price							0.234***	0.178***	0.146***
							[0.019]	[0.017]	[0.014]
Number of Rooms	-0.303***	-0.322***	-0.227***	-0.021	-0.011	0.034	-0.222***	-0.285***	-0.220***
	[0.096]	[0.065]	[0.054]	[0.026]	[0.028]	[0.025]	[0.058]	[0.037]	[0.032]
Hotel Age	0.262***	0.172***	0.122***	-0.004	-0.021**	-0.022**	0.190***	0.124***	0.087***
	[0.024]	[0.027]	[0.023]	[0.009]	[0.011]	[0.010]	[0.021]	[0.016]	[0.013]
Restaurant on Site	-0.058***	-0.081***	-0.108***	-0.018***	-0.034***	-0.046***	-0.007	-0.017***	-0.027***
	[0.007]	[0.006]	[0.005]	[0.003]	[0.003]	[0.003]	[0.005]	[0.004]	[0.004]
Air Conditioning	0.120***	0.101***	0.075***	0.063***	0.057***	0.057***	0.010**	0.006*	0.004*
	[0.005]	[0.005]	[0.005]	[0.002]	[0.002]	[0.003]	[0.004]	[0.003]	[0.002]
Outdoor Cafe	0.030***	0.042***	0.064***	0.006**	0.019***	0.015***	0.013**	0.010***	0.012***
	[0.007]	[0.006]	[0.006]	[0.003]	[0.003]	[0.004]	[0.005]	[0.003]	[0.003]
Fitness Facility	0.131***	0.118***	0.152***	0.010	0.052***	0.090***	0.059***	0.051***	0.024***
	[0.014]	[0.013]	[0.014]	[0.011]	[0.007]	[0.007]	[0.009]	[0.007]	[0.006]
Population	0.058***	0.042***	0.029***	0.015***	0.017***	0.013***	0.013***	0.006***	-0.001
	[0.002]	[0.002]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Income	0.278***	0.217***	0.190***	0.096***	0.106***	0.120***	0.049***	-0.002	-0.032***
	[0.011]	[0.009]	[0.009]	[0.004]	[0.004]	[0.004]	[0.008]	[0.006]	[0.005]
Tourism Intensity =1	0.028***	0.040***	0.043***	0.010***	0.013***	0.016***	0.023***	0.023***	0.019***
	[0.009]	[0.006]	[0.006]	[0.003]	[0.003]	[0.003]	[0.007]	[0.005]	[0.004]
Tourism Intensity =2	0.111***	0.116***	0.096***	0.022***	0.025***	0.031***	0.081***	0.070***	0.046***
	[0.011]	[0.008]	[0.008]	[0.003]	[0.003]	[0.004]	[0.008]	[0.005]	[0.005]
Tourism Intensity =3	0.290***	0.281***	0.240***	0.059***	0.064***	0.069***	0.206***	0.170***	0.113***
	[0.013]	[0.009]	[0.010]	[0.004]	[0.004]	[0.005]	[0.010]	[0.006]	[0.007]
Tourism Intensity =4	0.373***	0.323***	0.251***	0.070***	0.079***	0.090***	0.258***	0.204***	0.127***
	[0.014]	[0.012]	[0.013]	[0.005]	[0.005]	[0.006]	[0.013]	[0.007]	[0.007]
Constant	-0.272***	0.500***	0.962***	0.891***	0.918***	0.904***	2.346***	3.169***	3.702***
	[0.100]	[0.088]	[0.079]	[0.047]	[0.045]	[0.048]	[0.069]	[0.056]	[0.046]
Brand FE	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***
Observations	39226	39226	39226	37936	37936	37936	37936	37936	37936
# of Hotels	1194	1194	1194	1194	1194	1194	1194	1194	1194
Bootst. Repl.	50 †	50 †	50 †	100	100	100	100	100	100
Pseudo R2	0.50	0.55	0.56	0.78	0.79	0.77	0.30	0.28	0.25

Notes: Bootstrapped standard errors in brackets. Significant at: * 10%; ** 5%; *** 1%.
All specifications include 33 month dummy variables, 9 hotel competition and 5 local restaurant competition intensity dummy variables, as well as *dummy variables for other hotel characteristics,* namely presence of rental car counter, swimming pool, or conference room, and proximity to airport and to train station. For tourism intensity, the lowest level (=0) represents the omitted category. All specifications control for hotel unobserved correlated heterogeneity by modeling it as a function of the hotel level means of the following variables: number of rooms, age, and tourism intensity dummy variables. In addition, when the dependent variable is price (or occupancy rate), we include the mean of lagged occupancy rate (price). † Higher number of replications (we tried 100 and 200) reported convergence problems.

Finally, comparing the magnitudes of the estimates across quantiles for each outcome suggests that responses to organizational form are relatively similar across different parts of the outcome distributions. Thus our previous mean-focused estimations, in particular our IV results where we can fully endogenize organizational form, are sufficiently robust to yield reliable conclusions regarding the impact of franchising vs. corporate ownership on performance.

5. Conclusion

Using proprietary monthly panel data from a large multi-chain hotel company we examine the impact of organizational form, namely franchising vs. company ownership, on hotel-level outcomes - RevPar, Occupancy Rates, and Price. In the raw data, we found significant differences between the two organizational forms, in terms of higher prices and lower occupancy rates among franchised hotels. However, once we controlled for hotel and market characteristics, as well as for self-selection bias due to hotel unobserved correlated heterogeneity (i.e. hotel fixed effects), we found lower rather than higher prices, and lower revenues per available room (RevPar), but similar occupancy rates, in franchised compared to company-owned hotels. In addition the differences in prices and RevPar were small relative to those associated with other hotel characteristics such as the presence of air conditioning, or a fitness facility, or those due to market characteristics such as tourism intensity. These results were further supported by our quantile regressions, which showed that even when examining other parts of the outcome distributions rather than the means, the performance differences between franchised and corporate hotels were either insignificant or even smaller than those suggested by OLS estimates. Moreover, the responses to organizational form were quite similar across different parts of distribution.

Most importantly, we found that the differences in outcomes between franchised and corporate hotels all become statistically insignificant once we endogenize the choice of

organizational form in our performance equations. Empirical analyses of the effect of organizational form have suffered from a lack of good instruments in general, but as our data are comprehensive when it comes to the Company's operations, we have access to information on its governance decisions for other hotels in the same markets. We show that this variable is a very valid instrument in our context, and hope that similar instruments might prove useful in future analyses of effects of governance in the future.

Our finding, that there are no performance or price differences between hotels operated under the two modes of organization once such decisions are endogenized, is very robust across various specifications we estimate. We also find no evidence that outcome differences between the two organizational forms change with hotel size or age in regressions including cross-effects between our franchise dummy variable and hotel age or size. We conclude that the Company optimally chooses which outlets to franchise and own such that, conditional on market and hotel characteristics, and accounting for incentive and local knowledge utilization differences, in the end it achieves consistent results – in terms of RevPar, Occupancy rates, and prices – on average across both sets of hotels. In this regard, our findings support some previous studies, especially Hastings (2004), who similarly found that whether a branded gas station is company-operated or franchised does not change local market prices. In her setting the "company" could also freely decide which stations to own and which to franchise.

Overall, though our evidence is limited by the reliance on a single company's data, we view our results as supportive of the idea that when firm governance is not constrained by policy, organizational form decisions in the type of large, mature multinational firms such as the Company whose data we analyze, are rational. In fact, we expect that if the Company could systematically obtain larger revenues per room or higher occupancy rates or better prices, from its perspective, by modifying the organizational form under which some of its hotels operate, it

would do so. The stability of organizational form in our data suggests instead that the Company has not found many opportunities to improve hotel-level performance via changes in organizational form. In that sense, our results are consistent with the transaction cost argument that differences in outcomes due to organizational form should erode over time.

From a policy perspective, should one conclude from our results that regulation related to firm governance, e.g. laws for or against franchising, should have no effect on performance? Quite the opposite. In a broad sense, relating our results, obtained in a *policy unconstrained* setting, to those from studies that found significant performance differences when firms' choices of organizational forms *were restricted* by policy, suggests that such policy can significantly alter firm performance and outcomes. In other words, our results imply that firms do well for themselves when unconstrained, which does not mean that they would do as well if they were unable to adjust organizational form as they desire.

References

Blair, Roger D. and Francine Lafontaine. 2005. *The Economics of Franchising*, Cambridge University Press.

Barron, John M. and John R. Umbeck. 1984. The Effects of Different Contractual Arrangements: The Case of Retail Gasoline. *Journal of Law and Economics,* 27: 313-328.

Blass, Asher A. and Dennis Carlton, 2001. The Choice of Organizational Form in Gasoline Retailing and the Cost of Laws that Limit that Choice, *Journal of Law and Economics:* 44(2): 511-524.

Bradach, Jeffrey L. 1998. *Franchise Organizations*. Boston, MA: Harvard Business School Press.

Brickley, James A. and Frederick H. Dark. 1987. The Choice of Organizational Form: The Case of Franchising. *Journal of Financial Economics*, 18: 401-420.

Brickley, James A. 1999. Incentive Conflicts and Contractual Restraints: Evidence from Franchising. *Journal of Law and Economics*, 42: 745-774.

Bureau of Labor Statistics. Tables from Employment and Earnings: B-3. Employees on Nonfarm Payrolls by Major Industry Sector and Selected Industry Detail, Seasonally Adjusted. (http://www.bls.gov/ces/home.htm#ee).

Chernozhukov, Victor and Christian Hansen. 2006. Instrumental Quantile Regression Inference for Structural and Treatment Effect Models. Journal of Econometrics, 132(2): 491-525.

Ciliberto, Federico. 2006. Does Organizational Form Affect Investment Decisions? *Journal of Industrial Economics*, 54(1): 63-93.

Contractor, Farok K. and Sumit K. Kundu. 1998. Modal Choice in a World of Alliances: Analyzing Organizational Forms in the International Hotel Sector. *Journal of International Business Studies*, 29: 325-357.

Cox, J. and Colin Mason. 2007. Standardisation versus Adaptation: Geographical Pressures to Deviate from Franchise Formats. *The Service Industries Journal*, 27(8): 1053-1072.

Forbes, S. J. and M. Lederman. 2007. Does Vertical Integration Affect Firm Performance? Evidence from the Airline Industry. Mimeo, University of Toronto.

Gil, Ricard. 2009. Revenue Sharing Distortions and Vertical Integration in the Movie Industry. Journal of Law, Economics and Organization, 25: 579-610.

Gil, Ricard. 2010. An Empirical Investigation of the Paramount Antitrust Case, Applied Economics, 42: 171–183.

Graddy, Kathryn. 1997. Do Fast-Food Chains Price Discriminate on the Race and Income Characteristics of an Area. *Journal of Business and Economic Statistics*, 15: 391-401.

Hastings, Justine. 2004. Vertical Relationships and Competition in Retail Gasoline Markets: Empirical Evidence from Contract Changes in Southern California. *American Economic Review*, 94: 317-328.

Heckman, J. 1978. Dummy Endogenous Variables in a Simultaneous Equation System. *Econometrica,* 46(6): 931-959.

Heckman, J. 1990. Selectivity Bias: New Developments.Varieties of Selection Bias. *AEA Papers and Proceedings*, 80(2): 313-318.

HNN Hotelnewsnow.com. 2009 (January 20). Accor NA opens 57 hotels in 2008.

HNN Hotelnewsnow.com. 2009 (Februrary 5). 2008 Experiences Uptick in Conversions.

Ho, J., Ho, K and J. Mortimer. 2008. Welfare Effects of Full-line Forcing Contracts in the Video Rental Industry. NBER Working Paper # 14588.

Hotel and Motel Management. 2008 (September 15). Wheel of Misfortune.

Jin, Ginger and Philip Leslie. 2009. Reputation Incentives for Restaurant Hygiene. *American Economic Journal: Microeconomics*, forthcoming.

Joskow, Paul L. 2005. "Vertical Integration" in Ménard, C. and M. Shirley, eds., *Handbook of New Institutional Economics*, Dordrecht: Springer.

Kalnins, Arturs T. and Francine Lafontaine. 2004. Multi-Unit Ownership in Franchising: Evidence from the Fast-Food Industry in Texas. *RAND Journal of Economics*, 35: 747-761.

Kalnins, Arturs T. and Francine Lafontaine. 2010. Too Far Away? Examining How Distance to Headquarters Hurts Business Establishment Performance Mimeo, Cornell University.

Kehoe, Michael R.1996. Franchising, Agency Problems, and the Cost of Capital. *Applied Economics*. 28: 1485-1493.

Klein, Peter G. 2005."The Make-or-Buy Decision: Lessons from Empirical Studies" in Ménard, C. and M. Shirley, eds., *Handbook of New Institutional Economics*, Dordrecht: Springer.

Krueger, Alan B. 1991. Ownership, Agency and Wages: An Examination of the Fast Food Industry. *Quarterly Journal of Economics,* 106: 75-101.

Lafontaine, Francine and Emmanuel Raynaud. 2002. "Residual Claims and Self Enforcement as Incentive Mechanisms in Franchise Contracts: Substitute or Complements" in Brousseau, E. and J.M. Glachant, eds. *The Economics of Contract in Prospect and Retrospect*, Cambridge: Cambridge University Press.

Lafontaine, Francine and Kathryn L. Shaw. 2005. Targeting Managerial Control: Evidence from Franchising. *RAND Journal of Economics*, 36(1): 131-150.

Lafontaine, Francine and Margaret E. Slade. 2007. Vertical Integration and Firm Boundaries: The Evidence, *Journal of Economic Literature*, 45: 629-685.

Lafontaine, Francine and Margaret E. Slade. 2009. Inter-Firm Contracts: The Evidence. In *Handbook of Organizational Economics,* R. Gibbons and J. Roberts (eds.), forthcoming.

Maness, Robert. 1996. Incomplete Contracts and the Choice Between Vertical Integration and Franchising. *Journal of Economic Behavior and Organization* 31: 101-115.

Manolis, C., Dahlstrom, R. and A. Nygaard. 1995. A Preliminary Investigation of Ownership Conversions in Franchised Distribution Systems, *Journal of Applied Business Research*, 11 (2): 1-8.

Masten, Scott E. 1993. Transaction Costs, Mistakes and Performance: Assessing the Importance of Governance. *Managerial and Decision Economics,* Special Issue: Transaction Costs Economics, 14(2): 119-129.

Mazzeo, Michael J. 2004. Retail Contracting and Organizational Form: Alternatives to Chain Affiliation, *Journal of Economics and Management Strategy*, 13(4): 599-615.

McDonald's Corporation. 2003. Uniform Franchise Offering Circular.

Michael, Steven C. 2000. The Effect of Organizational Form on Quality: The Case of Franchising. *Journal of Economic Behaviour & Organization,* 43: 295-318.

Moulton, B. 1990. An Illustration of Pitfalls in Estimating the Effects of Aggregate Variables on Micro Units. *The Review of Economics and Statistics*, 72: 334-338.

Mullainathan Sendhil and David Scharfstein. 2001. Do Firm Boundaries Matter? *The American* Economic Review Papers and Proceedings, 91: 195–199.

Mundlak, Y. 1978. On the Pooling of Time Series and Cross Section Data. Econometrica, 46(1): 69-85.

Murray, Michael P. 2006. Avoiding Invalid Instruments and Coping with Weak Instruments. *Journal of Economic Perspective*s, 20 (4): 111-132.

Novak, Sharon and Scott Stern. 2008. How Does Outsourcing Affect Performance Dynamics? Evidence from the Automobile Industry. *Management Science*, 54: 1963-1979.

Petrin, Amil and Kenneth Train. 2009. A Control Function Approach to Endogeneity in Consumer Choice Models. *Journal of Marketing Research*, forthcoming.

Shane, Scott A. 1996. Hybrid Organizational Arrangements and their Implications for Firm Growth and Survival: A Study of New Franchisors. *Academy of Management Journal*, 39: 216-234.

Shaver, Myles. 1998. Accounting for Endogeneity When Assessing Strategy Performance: Does Entry Mode Choice Affect FDI Survival? *Management Science*, 44: 571-585.

Shelton, John P. 1967. Allocative Efficiency vs. 'X-Efficiency': Comment. *American Economic Review*, 57: 1252-1258.

Shepard, Andrea. 1993. Contractual Form, Retail Price, and Asset Characteristics. *Rand Journal of Economics*, 24: 58-77.

Slade, Margaret E. 1998. Beer and the Tie: Did Divestiture of Brewer-Owned Public Houses Lead to Higher Beer Prices? *Economic Journal*, 108: 1-38.

Smith II, Richard L. 1982. Franchise Regulation: An Economic Analysis of State Restrictions on Automobile Distribution. *Journal of Law and Economics*, 25: 125-157.

Staiger, Douglas and James H. Stock. 1997. Instrumental Variables Regression with Weak Instruments. *Econometrica*, 65: 557-586.

Stock, James H. and Motohiro Yogo. 2002. Testing for Weak Instruments in Linear IV Regression. NBER WP # 284.

Thomadsen, Raphael. 2005. The Effect of Ownership Structure on Prices in Geographically Differentiated Industries, *RAND Journal of Economics*, 36: 908-929.

Vita, Michael G. 2000. Regulatory Restrictions on Vertical Integration and Control: The Competitive Impact of Gasoline Divorcement Policies. *Journal of Regulatory Economics*, 18: 217-233.

Yvrande-Billon, Anne and Stéphane Saussier. 2005. "Do Organization Choices Matter? Assessing the Importance of Governance through Performance Comparisons", in Harvey S. James ed., *New Ideas in Contracting and Organizational Economics Research*, Kluwer Academic Publishers, Chapter 5.

Williams, Darrell. 1999. Why do Entrepreneurs Become Franchisees? An Empirical Analysis of Organizational Choice. *Journal of Business Venturing,* 14(1): 103-124.

Wooldridge, Jeffrey M. 1995. Selection Corrections for Panel Data Models under Conditional Mean Independence Assumptions. *Journal of Econometrics*, 68: 115-132.

Wooldridge, Jeffrey M. 2002. *Econometric Analysis of Cross Section and Panel Data*. Cambridge MA: MIT Press.

Data Appendix

This appendix provides more details about how we obtained some of the qualitative data we use in our analyses. But first, we describe the variation in our performance data within and between hotels.

Within and Between Hotel variation

We measure price, occupancy rates and RevPar using monthly data, where all monetary values are in Euros. Figure A1 presents the distribution of the hotel-level standard deviations for each measure and shows that there is extensive variation in all these measures within and across hotels. We also draw a horizontal line representing "the average" within-hotel standard deviation in our sample. For example, for prices, in panel a, the horizontal line indicates that on average the standard deviations around hotel means in our sample were about 4.65 Euros. The first bar in the figure also shows that about 5% of the hotels in our data (5^{th} percentile) experience average standard deviation in prices as low as 1 Euro, but at the other extreme, the standard deviations are as large as 9-22 Euros on average. We find similar patterns for RevPar and occupancy rates. Thus our data exhibit sizable within and between-hotels variation, which we exploit in our regression analyses by relying on monthly, rather than on more aggregate (e.g. annual) data.

Qualitative Hotel Information

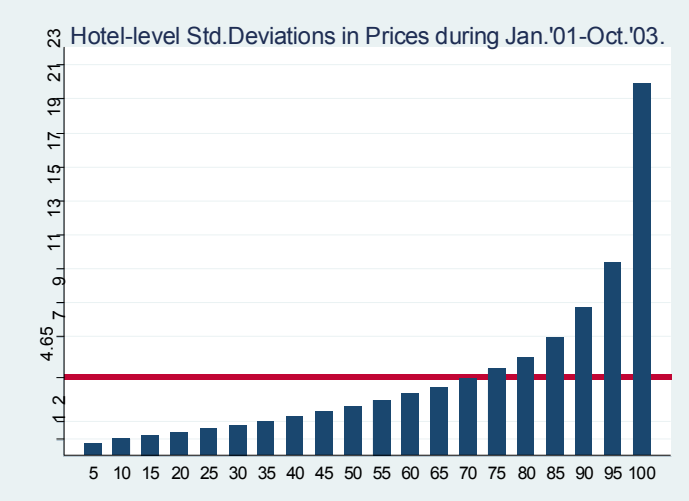
The following qualitative data for each hotel was obtained from hotel directories: information on the presence or not of a restaurant within or near the hotel; the presence or not of a rental car counter, an outdoor café, a swimming pool, a fitness facility; availability of conference rooms, air conditioning; and the proximity of a train station, and of an airport.

Restaurant and Hotel Competition Intensity Dummy Variables. *(The coefficients for these are not reported in the tables, but these variables were included in all regressions.)*

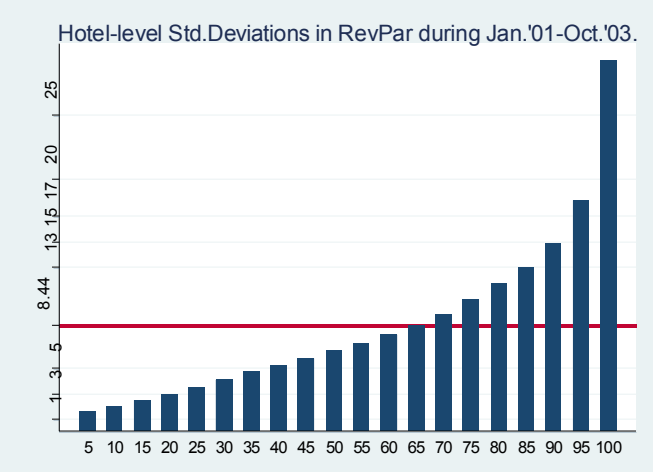
To control for the possibility that greater/smaller levels of concentration of other hotels and/or restaurants in the same market may affect performance of a given hotel, we created two sets of dummy variables based on government census data, namely: *hotel* and *restaurant competition-intensity dummy variables*. While government information on other hotels in a market was numeric in nature, the information on restaurant concentration was categorical. Also, since the government did not gather this type of information for large cities, we created dummy variables (instead of using the continuous measures) and assigned the highest concentration category to all hotels located in large cities. Specifically, for the *hotel competition dummy variables,* we divided the data on "Other Hotels in Market" into deciles and created a dummy for each decile. The hotels in large cities were all put into the highest (10^{th}) decile. Similarly, for the *restaurant competition dummy variables* - we created a dummy variable for each category in the government data (6 categories in total) and again assigned hotels in large cities to the highest competitive intensity category.

FIGURE A1: HOTEL-LEVEL STANDARD DEVIATIONS (in 5-percentiles) FOR OUTCOMES DURING JAN 2001- OCT. 2003.

a) Prices (Room Rates):



b) RevPar (Revenue per Available Room per day):



c) Occupancy Rates:

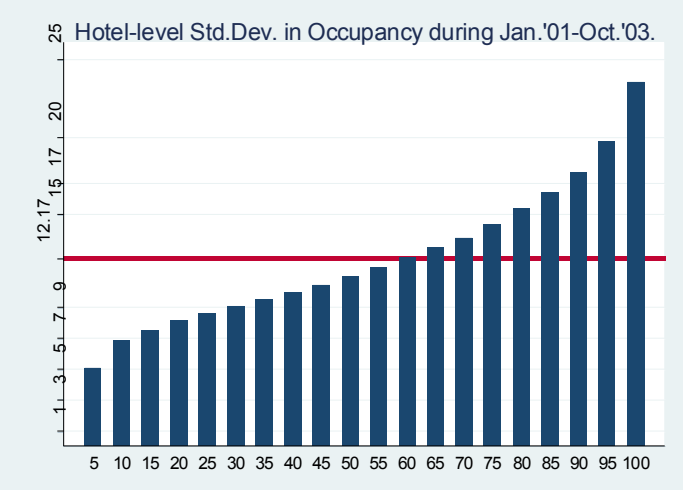


TABLE A1: FIRST-STAGE RESULTS FOR "FRANCHISE DUMMY" (IN TABLE 5), UNBALANCED SAMPLE.

Second-stage Dep. Variable	log(RevPar)	log(Price)	log(Occupancy Rate)
IV: *Company's Other Hotels in Mkt: Proportion Franchised*	0.341***	0.340***	0.344***
	[0.058]	[0.059]	[0.058]
Lagged Occupancy		-0.001	
		[0.003]	
Lagged Price			-0.011
			[0.008]
Number of Rooms	-0.005	-0.006	-0.006
	[0.007]	[0.008]	[0.008]
Hotel Age	-0.016	-0.014	-0.020
	[0.015]	[0.015]	[0.015]
Restaurant on Site	-0.218***	-0.220***	-0.226***
	[0.043]	[0.042]	[0.042]
Air Conditioning	0.097***	0.098***	0.110***
	[0.034]	[0.034]	[0.034]
Outdoor Cafe	-0.005	-0.003	-0.000
	[0.038]	[0.038]	[0.037]
Fitness Facility	-0.181***	-0.173***	-0.168***
	[0.058]	[0.059]	[0.058]
Population	-0.003	-0.002	0.001
	[0.011]	[0.011]	[0.011]
Income	-0.029	-0.019	0.008
	[0.054]	[0.054]	[0.056]
Tourism Intensity =1	0.000	0.001	0.001
	[0.001]	[0.001]	[0.001]
Tourism Intensity =2	0.000	0.001	0.001
	[0.002]	[0.002]	[0.002]
Tourism Intensity =3	-0.000	0.001	0.002
	[0.002]	[0.002]	[0.002]
Tourism Intensity =4	-0.002	0.001	0.001
	[0.003]	[0.003]	[0.003]
Constant	1.922***	2.213***	2.205***
	[0.515]	[0.566]	[0.530]
Brand Fixed Effects	Yes***	Yes***	Yes***
Observations	39226	37936	37936
# of Hotels	1194	1194	1194
F-stat on significance of IV	33.98***	33.60***	34.69***
Adj. R2	0.43	0.43	0.43

Notes: 1st-stage regressions show the results from the linear probability model estimated by standard 2SLS procedure (we report the 2nd stage results for the performance equation in Table 5). Standard errors – in brackets, are corrected for heteroscedasticity and hotel-level clusters. Significant at: * 10%; ** 5%; *** 1%. *All 1st-stage regressions include also* other variables included (but unreported) in the 2nd stage regressions, namely: *33 month dummy variables, 9 hotel competition and 5 local restaurant competition intensity dummy variables,* as well as *dummy variables for other hotel characteristics*: presence of rental car counter, swimming pool, or conference room, and proximity to airport and to train station. For tourism intensity, the lowest level (=0) represents the omitted category. In addition, we control for hotel unobserved correlated heterogeneity by modeling it as a function of the hotel level means of the same variables we use in the 2nd stages, namely: number of rooms, age, and tourism intensity dummy variables. Also, when the dependent variable in the 2nd stage is price (or occupancy rate), we include the mean of lagged occupancy rate (price).

TABLE A2: BALANCED SAMPLE, FRANCHISE STATUS TREATED AS EXOGENOUS.

	Dep. var= log (RevPar)			Dep. var= log(Price)			Dep. var= log(Occupancy Rate)		
		controlling for hotel unobserved correlated heterogeneity			*controlling for hotel unobserved correlated heterogeneity*			*controlling for hotel unobserved correlated heterogeneity*	
	OLS(cluster)	**OLS(cluster)**	**RE**	**OLS(cluster)**	**OLS(cluster)**	**RE**	**OLS(cluster)**	**OLS(cluster)**	**RE**
Franchised	-0.051***	-0.044**	-0.040**	-0.026**	-0.023**	-0.012*	-0.011	-0.004	-0.010
	[0.018]	[0.018]	[0.017]	[0.011]	[0.011]	[0.007]	[0.010]	[0.009]	[0.010]
Lagged Occupancy				0.155***	0.039***	0.039***			
				[0.014]	[0.004]	[0.003]			
Lagged Price							0.313***	0.197***	0.197***
							[0.031]	[0.023]	[0.015]
Number of Rooms	-0.012	-0.326***	-0.326***	0.015	-0.015	-0.015	-0.027**	-0.287***	-0.287***
	[0.025]	[0.050]	[0.035]	[0.016]	[0.034]	[0.016]	[0.012]	[0.038]	[0.029]
Hotel Age	0.060***	0.133***	0.133***	0.015	0.007	0.007	0.029***	0.090***	0.090***
	[0.015]	[0.023]	[0.018]	[0.009]	[0.012]	[0.007]	[0.008]	[0.021]	[0.015]
Restaurant on Site	-0.060**	-0.066**	-0.057**	-0.041**	-0.036**	-0.026	-0.004	-0.008	-0.009
	[0.029]	[0.029]	[0.027]	[0.018]	[0.017]	[0.016]	[0.015]	[0.015]	[0.015]
Air Conditioning	0.121***	0.119***	0.118***	0.068***	0.061***	0.067***	0.023**	0.016	0.016
	[0.021]	[0.021]	[0.020]	[0.013]	[0.012]	[0.011]	[0.011]	[0.011]	[0.012]
Outdoor Cafe	0.03	0.033	0.022	0.020	0.019	0.002	0.003	0.002	0.003
	[0.025]	[0.024]	[0.023]	[0.016]	[0.015]	[0.014]	[0.014]	[0.013]	[0.013]
Fitness Facility	0.129***	0.128***	0.127***	0.049	0.032	0.041	0.052**	0.053**	0.051*
	[0.046]	[0.047]	[0.047]	[0.035]	[0.035]	[0.028]	[0.025]	[0.025]	[0.027]
Population	0.044***	0.040***	0.041***	0.020***	0.017***	0.018***	0.013***	0.008**	0.008**
	[0.008]	[0.008]	[0.007]	[0.005]	[0.005]	[0.004]	[0.004]	[0.004]	[0.004]
Income	0.254***	0.268***	0.271***	0.171***	0.152***	0.162***	0.008	0.017	0.019
	[0.032]	[0.033]	[0.032]	[0.019]	[0.019]	[0.018]	[0.020]	[0.021]	[0.019]
Tourism Intensity =1	0.007	0.045***	0.045***	0.012**	0.014***	0.014***	-0.011	0.023**	0.023***
	[0.012]	[0.011]	[0.005]	[0.006]	[0.003]	[0.002]	[0.009]	[0.009]	[0.004]
Tourism Intensity =2	0.036**	0.121***	0.121***	0.024***	0.033***	0.033***	-0.001	0.072***	0.072***
	[0.014]	[0.014]	[0.006]	[0.007]	[0.004]	[0.002]	[0.010]	[0.011]	[0.005]
Tourism Intensity =3	0.167***	0.316***	0.316***	0.066***	0.085***	0.085***	0.056***	0.196***	0.196***
	[0.019]	[0.019]	[0.007]	[0.010]	[0.006]	[0.003]	[0.012]	[0.015]	[0.006]
Tourism Intensity =4	0.191***	0.368***	0.368***	0.097***	0.101***	0.101***	0.053***	0.236***	0.235***
	[0.023]	[0.024]	[0.009]	[0.014]	[0.007]	[0.003]	[0.013]	[0.019]	[0.007]
Constant	0.122	0.031	-0.0001	0.879***	0.256	0.276	3.056***	2.863***	2.902***
	[0.319]	[0.329]	[0.307]	[0.191]	[0.207]	[0.205]	[0.189]	[0.201]	[0.187]
Brand Fixed Effects	Yes**	Yes**	Yes**	Yes**	Yes**	Yes**	Yes**	Yes**	Yes**
Observations	36448	36448	36448	35376	35376	35376	35376	35376	35376
R2	0.76	0.76	0.76	0.93	0.94	0.95	0.44	0.46	0.46
# of Hotels	1072	1072	1072	1072	1072	1072	1072	1072	1072

Notes: See Table 4.

TABLE A3: IV ESTIMATIONS, FRANCHISE STATUS TREATED AS ENDOGENOUS.
BALANCED SAMPLE; ALL SPECIFICATIONS CONTROL FOR HOTEL UNOBSERVED CORRELATED HETEROGENEITY.

Dependent Variable	log(RevPar)	log(Price)	log(Occupancy Rate)
Franchised	-0.087	0.043	-0.083
	[0.099]	[0.060]	[0.058]
Lagged Occupancy		0.039***	
		[0.004]	
Lagged Price			0.197***
			[0.023]
Number of Rooms	-0.327***	-0.014	-0.288***
	[0.050]	[0.033]	[0.038]
Hotel Age	0.132***	0.007	0.089***
	[0.023]	[0.012]	[0.022]
Restaurant on Site	-0.076**	-0.019	-0.028
	[0.039]	[0.021]	[0.022]
Air Conditioning	0.124***	0.053***	0.026**
	[0.023]	[0.014]	[0.013]
Outdoor Cafe	0.033	0.018	0.004
	[0.024]	[0.016]	[0.014]
Fitness Facility	0.120**	0.044	0.040
	[0.049]	[0.037]	[0.027]
Population	0.040***	0.018***	0.008**
	[0.008]	[0.005]	[0.004]
Income	0.267***	0.152***	0.020
	[0.033]	[0.019]	[0.021]
Tourism Intensity =1	0.045***	0.014***	0.023**
	[0.011]	[0.003]	[0.009]
Tourism Intensity =2	0.121***	0.033***	0.072***
	[0.014]	[0.004]	[0.011]
Tourism Intensity =3	0.316***	0.085***	0.196***
	[0.019]	[0.006]	[0.015]
Tourism Intensity =4	0.368***	0.101***	0.235***
	[0.024]	[0.007]	[0.019]
Constant	0.110	0.111	3.032***
	[0.364]	[0.238]	[0.237]
Brand Fixed Effects	Yes**	Yes**	Yes**
Observations	36448	35376	35376
# of Hotels	1072	1072	1072

Notes: See Table 5.

TABLE A4: IV ESTIMATIONS WITH ALTERNATIVE INSTRUMENTS FOR FRANCHISE STATUS: "HOTEL DENSITY + DISTANCE TO FRANCHISOR'S HEADQUARTERS".
UNBALANCED SAMPLE; ALL SPECIFICATIONS CONTROL FOR HOTEL UNOBSERVED CORRELATED HETEROGENEITY.

Dependent Variable	log(RevPar)	log(Price)	log(Occupancy Rate)
Franchised	0.362	0.364	0.030
	[0.416]	[0.279]	[0.182]
Lagged Occupancy		0.045***	
		[0.006]	
Lagged Price			0.219***
			[0.022]
Number of Rooms	-0.263***	0.007	-0.267***
	[0.070]	[0.028]	[0.041]
Hotel Age	0.248***	-0.016	0.194***
	[0.024]	[0.010]	[0.020]
Restaurant on Site	0.019	0.050	-0.001
	[0.099]	[0.070]	[0.046]
Air Conditioning	0.059	0.025	0.001
	[0.049]	[0.034]	[0.024]
Outdoor Cafe	0.036	0.011	0.009
	[0.029]	[0.023]	[0.014]
Fitness Facility	0.219**	0.105	0.066*
	[0.093]	[0.065]	[0.039]
Population	0.041***	0.014**	0.011**
	[0.010]	[0.007]	[0.005]
Income	0.273***	0.162***	0.018
	[0.043]	[0.028]	[0.021]
Tourism Intensity =1	0.051***	0.017***	0.026***
	[0.011]	[0.003]	[0.009]
Tourism Intensity =2	0.137***	0.038***	0.080***
	[0.015]	[0.004]	[0.011]
Tourism Intensity =3	0.339***	0.089***	0.208***
	[0.020]	[0.006]	[0.014]
Tourism Intensity =4	0.412***	0.113***	0.257***
	[0.027]	[0.009]	[0.019]
Constant	-0.587	-0.406	2.818***
	[0.884]	[0.672]	[0.452]
Brand Fixed Effects	Yes**	Yes**	Yes**
Observations	39226	37936	37936
# of Hotels	1194	1194	1194

Notes: Both instruments are in logs. For other notes, see Table 5.