ORGANIZATIONAL FORM AND PERFORMANCE: EVIDENCE FROM THE HOTEL INDUSTRY

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Abstract—We use a unique proprietary panel data set from a large hotel company to study how organizational form affects hotel pricing and performance. Aggregate data patterns suggest sizable performance differences between franchised and company-operated hotels. However, after controlling for other factors, we find that if significant at all, such differences are economically small. Moreover, once we endogenize the choice of organizational form, the differences become insignificant. We conclude that the company chooses which hotels to franchise and operate corporately such that, conditional on hotel and market characteristics, it obtains consistent outcomes across organizational forms.

I. Introduction

HOW firms organize their transactions and how this affects their performance are central issues in economics. A number of 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, Mullainathan and Scharfstein (2001) argue that 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 or perform better or worse than those that do not? And if not, why not? These questions are particularly important given that whatever affects firm performance ultimately also determines a firm's long-term competitiveness and survival.[2]

Empirical studies of the effects of organizational form are rare for a reason, however. 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 choose various options based on what they expect will give the best outcome in a given situation.[3] This optimizing behavior is, of course, exactly what the literature on organizational form decisions relies on and captures. Unfortunately, it also raises important endogeneity issues when it comes to assessing the effects of organizational form or contractual practices on outcomes. In fact, the presence of performance differences across transactions organized differently in settings where firms can freely choose how they organize their transactions leads to a conundrum: If one organizational form would systematically outperform the other, why should a firm use any other? If a firm persistently chooses different organizational forms across its transactions, it must be because different circumstances call for different such decisions, as the empirical literature on the choice of organizational form has demonstrated. These different organizational form decisions, however, should not lead to differences in outcomes that could damage the brand; otherwise, the firm would organize its transactions differently. This suggests that outcomes that the firm cares about should be similar, in the end, across organizational forms; otherwise, the firm would have incentives to adjust its organizational form decisions.

This paper relies on a unique proprietary panel data set 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 1,194 hotels that the company has established in a single country. Our information on these is quite detailed, includ-

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[1] For 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 interfirm contracts, see Lafontaine and Slade (2012).

[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 (2010) examine how organizational form choices for a given transaction in the airline industry affect 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.

[3] See Masten (1993) and Yvrande-Billon and Saussier (2005) for more discussion.

[4] We sincerely thank the director of franchising of this major corporation for access to these data. For confidentiality reasons, we refer to this corporation as "the company" throughout. Also, we have agreed not to reveal the number of chains or the markets in which the firm operates.

ing monthly hotel-level information on price, as well as standard industry performance metrics: occupancy rates and revenues per available room (RevPar) over a period of 34 months. We also know whether the hotel is franchised or vertically integrated, as well as individual hotel size, age, and many other hotel characteristics. We also have data on the 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 later—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.

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 Lafontaine and Slade (2007) noted, 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 of 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 focal hotel. The organizational form that the company chooses for its other hotels in the same market is an ideal instrument as it reflects (to us) unobserved company cost associated with 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 have an impact on the individual hotel's behavior or performance directly.

We find that comparing unconditional average outcomes between franchised and corporate hotels reveals economically sizable and statistically significant differences, in the form of lower occupancy rates and higher prices in franchised than in corporate-run hotels. Once we control for hotel and market characteristics in regression analyses, as indeed we should, we find lower revenues per available room (RevPar) and lower prices in franchised compared to corporate hotels. More important, and consistent with results obtained in the literature when authors have tried to control for similar factors in their analyses (Shepard, 1993; Bloom, Kretschmer, & Van Reenen, 2011), these differences become 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 become both economically and statistically insignificant when we endogenize the choice of organizational form.

These results, which are robust across our numerous specifications, imply that the company chooses which hotels to franchise and which to own in a way that yields no difference in the end in either pricing or performance between the two sets of hotels. These findings contrast with those of studies where differences in organizational forms were mandated by government policy. In such studies, authors found important differences in performance across organizational forms. Our results suggest instead that these differences should be attributed to the requirement that the firm use an organizational form it would not have chosen—one that is suboptimal under the circumstances—rather than to the imposed organizational form itself. Our results are important, then, because they imply that when firms' governance choices are unrestricted, they can make these decisions in a way that yields similar outcomes across governance forms. In that sense, our findings explain the persistent coexistence of different organizational forms while confirming the conjecture of transaction cost economics that differences in outcomes due to organizational form per se should erode over time.[5] Our results, moreover, confirm that firms can effectively use their choice of organizational form to adjust to various market and outlet-level differences such that, in the end, their outlets need not perform differently. In other words, our findings confirm the important role of organizational form decisions for firm performance.

The paper is organized as follows. In the next section, we briefly review the relevant literature and discuss the fundamental differences between franchising and corporate ownership and their potential implications for pricing and performance outcomes. We then explain the fundamental problem of selection that complicates analyses of the performance effects of organizational form. In section III, we describe our data and present some preliminary evidence. We discuss our empirical methodology and results in section IV, and conclude in section V.

II. Organizational Form and Performance

A. *Brief Overview of the Literature*

Mullainathan and Scharfstein (2001) note that although the theoretical literature is replete with models characterizing how and why firm boundaries should matter for firm

[5] See 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.

behavior and performance, little attention has been given to assessing the consequences of integration decisions empirically. To our knowledge, Shelton (1967) was the first to address this question. He did so by measuring the effect of switching from franchising to company ownership, and from company ownership back to franchising, on outlet costs, revenues, and profits in a single franchise chain. He found no tendency for revenues to differ across the two governance regimes, but under company ownership, costs were higher, and thus profits were lower, than under franchising.

The main advantage of Shelton's study was its within-outlet design, which held outlet and market characteristics constant as the mode of organization changed. Its main drawback, however, was that outlets in the chain he studied were operated under company ownership only during transition periods. In other words, franchising was the preferred mode of organization, and company ownership was only a transitory phase at any given outlet. It is not so surprising, under these circumstances, that company ownership turned out to be a low-performance (high-cost) organizational form. Also, Shelton relied on accounting cost and profit data that, 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 that franchisors base their royalty and advertising fees on revenues. Despite these drawbacks, Shelton's analyses and findings were groundbreaking.

Several authors since have looked for differences in firm performance or behavior across governance forms through the lenses of "natural experiments" arising from changes in regulatory regimes. The most famous of these has been the case of gasoline retailing regulation. 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 consumers. The empirical literature (Barron & Umbeck, 1984; Vita, 2000; Blass & Carlton, 2001) instead has found 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 (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 U.K. 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]

A related but different literature finds differences in performance between vertical integration and separation in contexts where firms are constrained by labor unions to limit the extent of integration (Forbes & Lederman, 2010, on airlines) or to continue to operate corporate outlets (Arruñada, Vázquez, & Zanarone, 2009, on car dealerships in Spain).

Though limited, the empirical evidence has been 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 if policy were not in place, authors find differences in prices and other observed outcomes at the outlet level.

Our interest, however, 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 is that a mandated organizational form, or an organizational form used during a transition period only, as in Shelton's study, is by definition suboptimal since the firm's preferred option is either unfeasible or prohibited. In other words, the policy changes considered in the literature not only affect the costs and benefits of decision makers' options, as would be typical in the "treatment effect" literature, but rather dictated their final choices (as did divorcement laws or labor unions). Analyses based on such policies clearly allow authors to identify the costs of mandating specific organizational form changes. But this is not the same as identifying the effects of organizational form choices on performance in the "unconstrained" context—when the firm still might have made a different choice—as the differences in outcomes in the constrained case can be attributed simply to the inefficiency of the mandated organizational form.

To address the question of whether differences in outcomes should arise due to organizational form per se, that is, when firms can choose and adjust governance form freely, we follow Shelton, and a few other studies that we mention below, and conduct our analyses in the context of franchising. An 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.[8] The company whose data we rely on indeed maintains both types of operations over time within each of its

[6] In its 2003 Uniform Franchise Offering Circular, among a series of caveats relating to cost estimation from franchised store data, McDonald's (2003) 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.

[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.

[8] See Blair and Lafontaine (2005) for data on corporate outlets in mature franchised chains.

chains, and, contrary to Shelton, it does so purposely rather than using one of them only during transition periods. In this setting, we can examine whether pricing decisions and other outcomes differ between the company-operated and franchised outlets of the same chain within the same company, thus holding constant many chain- and firm-level policies and related variables that might affect outcomes. In addition, we can avoid self-selection bias—issues surrounding the decision of which hotels are franchised and which are corporate—by controlling explicitly for many hotel and market characteristics, as well as hotel-level unobserved correlated heterogeneity. Finally, we address remaining potential identification issues using an instrumental variable approach that we describe further below. But first we discuss the fundamental differences between franchised and corporate outlets and their potential implications for pricing and performance outcomes, as well as the results of the few studies since Shelton (1967) that have examined these issues empirically.

B. Franchising versus Company Operation

As is well known, the incentives of hired managers and franchisees, and their objectives, can be very different, potentially leading them to put forth different levels of effort that could affect outcomes.[9] Theories yield different predictions, however, as to the form of pricing and other 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 demand will be higher, and average variable costs lower, in franchised than in corporate outlets. On the other hand, a franchisee's ownership of his outlet may lead him to free ride on the value of the brand. This could lead to lower quality levels and thus lower demand, and/or higher prices, in franchised outlets.[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, according to 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]

Price has been the outcome variable that has attracted the most attention in the empirical literature, however. This is because 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, and this might increase costs and prices more generally in franchised outlets. Second, if an establishment has market power and the franchise contract involves royalty payments, double marginalization might lead to higher prices in franchised than in corporate hotels. Third, the presence of positive spillovers can result in franchisees' choosing prices above those that maximize the chain's profits (prices that would be set in corporate outlets). Finally, a franchisee who successfully increases demand at his hotel through higher effort might also price higher as a result.

While these arguments imply there should be differences in prices between the two organizational forms, it is also true that depending on the regulatory environment and their preferences, franchisors may be able and choose to impose pricing restraints on franchisees to induce similar prices in both corporate and franchised outlets.[13] Alternatively, if franchisors are unhappy with the pricing decisions of their franchisees, they can buy back and directly operate outlets whose prices are out of line with their preferences and in that way make prices more similar across the two sets of outlets.

Shepard (1993), Hastings (2004) and Hosken, McMillan, and Taylor (2008) have examined how price differs between gasoline stations that are franchised versus those that are operated directly by oil companies in contexts where the companies were not constrained to choose one form of organization or another. While Shepard (1993) found the prices of some products to be somewhat higher in franchised gasoline stations, Hastings (2004) found no such difference, and Hosken et al. (2008) concluded that prices were higher in company-operated stations.

Rather than examining differences in prices, a few authors have looked for evidence of quality differences between the two types of outlets. Bradach (1998, p. 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 and 93.9 for the corporate outlets in the first chain and 89.7 and 90.6, respectively, for the

[9] See Brickley and Dark (1987), Lafontaine (1992), Bradach (1998), and Blair and Lafontaine (2005), and references therein.

[10] Franchisees also sometimes argue that their franchisor behaves opportunistically toward them. In the hotel industry, one version of this argument is that lodging companies favor corporate 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, Dahlstrom, and Nygaard (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 sizable literature in management on differential survival rates between franchised and company-operated or individually owned businesses. Blair and Lafontaine (2005) provide an overview of these issues.

[13] Most of the studies of pricing differentials in franchised businesses in the United States have been carried out at a time when vertical price restraints were treated as "per se" violations of antitrust laws. In our data, the high variation in prices (see the online data appendix) and significant differences between average prices of franchised and corporate hotels (table 3) confirm that the company was not imposing a requirement of consistent prices across properties. See Blair and Lafontaine (2005) for more on this issue.

other. He concluded that there was no quality difference between the two types of outlets. Using data on quality ratings published by Consumer Reports, Michael (2000) 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 the corporate than the franchised restaurants of the same chains in their data.

In sum, the evidence on the question of whether there are differences in outcomes between the two types of outlets remains mixed, especially in contexts where a firm's choice of organizational form is "unconstrained." To shed more light on this issue, we explore whether differences in organizational form lead to differences in the three standard outcome variables used in the hotel industry: prices, occupancy rates, and revenues per available room (RevPar).

III. The Data

We rely on two complementary data sources in this paper. The first is a confidential data set provided by the company, a large hotel firm with extensive operations worldwide. The data set includes monthly data on occupancy rates, average room price, and total revenues for all the company's hotels in a single country. The data cover the period from January 2001 to October 2003, for a total of 34 observations for most of the 1,194 hotels in the data. In fact, the average number of observations per hotel in our sample is 32, so our panel data is quite balanced.[14] All the hotels in the data are operated under one of six brands, with each brand belonging to a quality tier from budget to luxury.[15] For each hotel, we know whether it is operated by the franchisor or belongs to a franchisee, and, in the latter case, who the franchisee is.[16] A third form of organization used in this industry is also present here: a few hotels are operated under management contracts (Kehoe, 1996; Lafontaine, Perrigot, & Wilson, 2013). In these cases, a third party (usually a local investor/developer) owns the physical property, but the company hires managers to 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 (that is, corporate hotels). Our results are robust to excluding these from our analyses.

The data also contain information about hotel location. From this, we can measure the distance of the hotel from the company's headquarters and calculate the number of hotels of the company across all its brands in a market (Hotel Density).[17] The geographic market definition we rely on is an administrative unit, defined by the government and characterized by separate jurisdiction or institutions, which in terms of size is about the same as or smaller than a U.S. county. This allows us to capture fine-grained variation in economic and institutional factors across markets (as discussed further below) that could otherwise bias our estimates. Our company operates hotels across 582 such markets. The distribution of the company's hotels across these 582 markets is highly skewed; in 88% of the markets, there are only 1 to 3 hotels affiliated with the company. But because a few markets are quite large, as table 1 shows, on average a hotel in our data operates in a market with about 9 other hotels belonging to our company and about 22 hotels in total. Similarly, the distribution of hotels operated by other firms is also skewed: about 50% of the markets in our data have fewer than 5 hotels belonging to other firms than our company.[18] Further, since we know the date at which each hotel our data began its operations or became part of the company's hotels, we can calculate the proportion of the company's other hotels in the same market as hotel i (sum over all brands) that are franchised. We use this variable as our main instrument in our analyses and discuss it further in sections IVA and IVC.

We know the brand under which each hotel operates, hotel age and size (in number of rooms), and other hotel characteristics, including hotel amenities—for example, whether the hotel offers air-conditioned rooms, a fitness facility, a pool, 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 online data appendix for more details). We include all these as control variables 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.

To control for local market characteristics, we use 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

[14] As we discuss in section IVC, our results are robust to excluding the few hotels with shorter time series.

[15] At the time we obtained the data, the company operated 1,305 hotels across seven brands. One of its smaller brands (36 hotels), however, was fully corporate. We eliminated 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 1,194 hotels across six brands. When measuring variables relating to "other hotels of the company," however, we use the information for all 1,305 hotels.

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

[17] We count the company's hotels and define related variables using the 1,305 hotels of the company in our raw data.

[18] Freedman and Kosová (2012) also find that "about 82% of the ... counties in the U.S. have at least one hotel each year during 1993–2006. However, the distribution of hotels across counties is highly skewed. Among counties with at least one hotel, the average number of hotels per county (14.6) is roughly three times the median number of hotels per county (five)."

TABLE 1—DESCRIPTIVE STATISTICS, BY HOTEL

	Mean	SD	Minimum	Maximum
Price (room rate)[a]	53.67	31.45	20.38	292.54
RevPar[a]	37.23	21.73	10.51	196.79
Occupancy rate (%)	70.43	10.94	32.25	101.39
Revenues/month (000s)[a]	172.31	251.47	20.15	3,118.99
Number of rooms	91.24	67.35	29.94	782
Hotel age	13.41	8.37	1	73.94
Other hotels in market[b]	22.19	33.19	0	266
Tourism intensity	1.71	1.08	0	4
Population	193,383	498,502	192	2,125,851
Income[a]	9,993.03	2,110.97	4,161.71	23,021.63
Franchised	0.34	0.47	0	1
Restaurant on site	0.44	0.50	0	1
Outdoor café	0.27	0.44	0	1
Air conditioning	0.47	0.50	0	1
Fitness facility	0.05	0.23	0	1
Proportion of company's other hotels in local market that are franchised[c]	0.17	0.22	0	0.80
Distance from headquarters	300.55	221.32	0	917.18
Total number of company's hotels in local market (hotel density)[c]	9.37	22.71	1	99

[a] In euros.
[b] This information is available only for 1,015 of the 1,194 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.
[c] Company hotel counts are based on the company's full set of hotels (1,305) in the raw data.

scale of 0 (none) to 4 (very high), over the full calendar year for each local market.[19] Having access to 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 specific 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 may 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.[20]

Performance in the hotel industry is typically measured 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.[21] Unlike room price (average daily rate), RevPar also captures the level of occupied capacity: it amounts to price multiplied by average occupancy rate for the month, and as such represents a measure of yield.[22] In our analyses, we consider all three dependent variables: occupancy rates, RevPar, and price.

We show descriptive statistics for all the variables 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 unit of observation.

Table 2 shows the same information for different hotel brands. For confidentiality reasons, we grouped the company's six brands into five brand groups, that is, we combine the hotels operating under two similar brands in one of our five brand groups. Since the different brands represent different quality tiers, from luxury to budget, with correspondingly different prices, we show the five brand groups ranked by average prices, from highest to lowest. This table highlights the important differences in the levels of many of our variables, including the extent of franchising, across the company's hotel brand groups. This indicates that we must control for brand-specific effects in our empirical model if we are to identify performance differences between franchised and company-operated hotels.

Given our interest in performance differences between the two organizational forms, table 3 compares franchised and

[19] These data were obtained through surveys of local officials and represent local assessment of how desirable each locality is from a tourism perspective at different months in the calendar year.

[20] We use these different sets of dummy variables rather than more traditional geography-based dummy variables as controls for market and location fixed effects in part because we have so few hotels in many local markets. As a result, market-specific effects cannot be identified separately from hotel-specific effects. More important 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.

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

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

TABLE 2—DESCRIPTIVE STATISTICS PER BRAND GROUP AND HOTEL; MEANS (SD)

	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)[a]	98.99	77.39	54.10	32.91	23.40
	(42.77)	(19.30)	(8.73)	(4.15)	(1.70)
RevPar[a]	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 (000s)[a]	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[c]	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	1.88	1.74	1.25
	(1.12)	(1.06)	(1.03)	(1.11)	(0.99)
Population	303,405	303,613	240,994	102,683	49,352
	(625,310)	(628,190)	(555,206)	(320,425)	(191,733)
Income[a]	10,739	10,305	9,956	9,750	9,544
	(2,137)	(2,267)	(2,073)	(2,079)	(1,879)
Restaurant on site	0.99	0.68	0.64	0	0
	(0.08)	(0.47)	(0.48)		
Outdoor café	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)			
Proportion of company's other hotels in market franchised[d]	0.18	0.17	0.20	0.17	0.13
	(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)
Total number of company's hotels in Market (hotel density)[d]	14.42	14.23	11.44	5.24	3.02
	(28.48)	(28.91)	(25.38)	(14.11)	(8.46)

Brand groups are ordered by average price of room from the highest to lowest. In total we have six brands in our data. For confidentiality reasons we grouped two smaller brands (representing similar hotel-quality level) into one group.

[a] In euros.

[b] The number of hotels across all brands adds to 1,196 rather than 1,194 because 2 hotels changed brand during our sample period. In the above statistics, we include them in both groups.

[c] This information is available for only 1,015 of the 1,194 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.

[d] Company hotel counts are based on the company's full set of hotels (1,305) in the raw data.

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 in the end, revenue per available room (RevPar) is the same across the two groups.

The data also show that 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 drive the decision to franchise, table 3 also suggests that on average, franchised hotels are located farther away from headquarters and operate in markets where the company also franchises a larger proportion of its hotels (see Kalnins & Lafontaine, 2004, on the clustering of franchised and of corporate outlets in franchised chains). The demographic characteristics of the markets—income and population—are not significantly different between the two sets of hotels, however. And contrary to what one might expect from a monitoring perspective, franchised hotels operate in markets where the company has larger numbers of hotels. Finally, compared to corporate properties, franchised hotels are more likely to offer amenities such as outdoor cafés or air conditioning but less likely to offer fitness facilities. The last two patterns are likely driven by the large number of corporate hotels in groups 4 and 5, which are the lowest-priced hotels with almost no amenities, located in markets where the company and other hoteliers 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 therefore turn to regression ana-

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

	Franchised: 406 Hotels out of 1,194 = 34%	Corporate: 788 Hotels out of 1,194 = 66%	Difference in Means
Price (room rate)[a]	56.35	52.29	**
	(20.60)	(35.71)	
RevPar[a]	38.60	36.52	
	(15.35)	(24.36)	
Occupancy rate (%)	68.31	71.52	***
	(11.51)	(10.48)	
Revenues/month (000s)[a]	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[b]	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	9,929	10,026	
	(2,051)	(2,141)	
Restaurant on site	0.46	0.43	
	(0.50)	(0.50)	
Outdoor café	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)	
Proportion of company's other hotels in market franchised[c]	0.23	0.14	***
	(0.24)	(0.20)	
Distance from headquarters	322.06	289.47	**
	(221.64)	(220.47)	
Total number of company hotels in market (hotel density)[c]	10.97	8.54	*
	(25.96)	(20.81)	

Significance levels: *10%, **5%, and ***1%.

[a] In euros.

[b] These data are available only for 1,015 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.

[c] Company hotel counts are based on the company's full set of hotels (1,305) in the raw data.

lyses in the next section, where we exploit both the within- and between-hotel variation in our data (see figure A1 in the online data appendix for more details).

IV. Methodology and Results

A. Baseline Specifications and Results

Our goal is to estimate whether franchised hotels differ in terms of pricing and performance from corporate hotels. To do so, we estimate an empirical model of the following general form:

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

where i and t index hotel and months (1 through 34), respectively, and Y_{it} stands for the (log) of our outcome variable of interest, namely, revenues per available room (RevPar), price (room rate), or occupancy rate. F_{it} describes organizational form, where each hotel in a given month can either be franchised ($F_{it} = 1$) or company operated ($F_{it} = 0$, the 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 and also restaurants) dummy variables. As implied by the data in tables 2 and 3, it is important to include all these variables; otherwise our coefficient estimate for the franchise dummy variable would be biased. Moreover, dummy variables indicating the presence of various amenities as well as brand dummy variables are important as they capture major sources of cost differences among hotels. Controlling for these thus allows us to interpret differences in occupancy rates and in RevPar in terms of bottom-line performance to some extent. Finally, we control for changes in aggregate demand over time, as well as changes in company policies (such as company advertising) and other unobserved shocks common across all the hotels of the company, by including a dummy variable d_t for each month-year combination in our data (33 in total).

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 our analyses, we control for hotel-level unobserved and uncorrelated heterogeneity (μ_i) by correcting standard errors for hotel-level clusters, as well as estimating a random effects specification (RE).[23] Moreover, in all estimations we correct standard errors for (potential) heteroskedasticity by using the White/Huber robust estimator of the variance-covariance matrix. All continuous variables are included in the regressions in logarithmic form so that the coefficient estimates represent elasticities. This functional form allows for nonlinear relationships among variables and reduces the potential impact of outliers or skewed regressors and thus yields more robust coefficient estimates.

Consistent with business practice in the hotel industry, we expect price changes 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 variable. Similarly, since customers usually reserve rooms in advance or decide whether to stay in a hotel based on their expectations about price or hotel quality, all of which are affected by prices posted at the time of the reservation, we include the lagged value of price (in logs) as a control variable in occupancy rate regressions. Empirically these lagged values are predetermined (and thus exogenous) variables, as they are known already when the performance outcome is measured.

We show results from OLS regressions for our three dependent variables in columns 1, 4, and 7 of table 4. One potential concern with OLS estimation is that some of the unobserved hotel heterogeneity (μ_i), such as the quality of hotel management or characteristics of the hotel location (coastal or mountain area, for example) that are not captured by our control variables, might be correlated with organizational form. 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 heterogeneity), we follow Mundlak (1978) and include hotel-level means of time-varying regressors as additional control variables in our regressions.[24] 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 ($X_{it,}\ t = 1,\ldots,34$).[25] In this equation, a_i represents that part of hotel unobserved heterogeneity (in the error term) that is uncorrelated with the regressors and that we control for via hotel-level clusters.

We rely on Mundlak's approach, rather than standard fixed-effects estimation, because our dependent variables show rich within-hotel monthly variation (see the online appendix) that we want to exploit in our analysis, but our main variable of interest, organizational form, changes little over time. In this situation, estimating a standard fixed-effects model, which amounts to relying on within-hotel time variation only, would prevent us from identifying the impact of organizational form.[26] Modeling 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.[27]

Results from this procedure are also shown in table 4, in columns 2–3, 5–6, and 8–9. In most cases, they are similar to our OLS results in columns 1, 4, and 7, but for some variables, the size or statistical significance of the coefficients changes, pointing out the importance of controlling for unobserved correlated heterogeneity.

Results in table 4 are quite consistent when it comes to differences in outcomes between the two organizational forms. Though the random effects estimate of the coefficient for the franchised dummy variable is insignificant in column 6, the OLS estimates suggest that franchisees charge lower prices rather than higher ones, as was implied by our simple descriptive statistics above. Moreover, occupancy rates are similar across franchised and corporate hotels. The combination of these two effects in turn implies lower revenues per available room among franchised hotels,

[23] 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 when deriving the coefficient estimates through generalized least squares (GLS) estimation. If the equal correlation structure assumption is correct, the RE model provides more efficient estimates; if not, then the OLS with clustered standard errors estimates (which do not rely on any GLS procedure) are more appropriate. We report results from both specifications in table 4.

[24] 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. We include the means not only in random effect specifications but also in OLS estimations, because, as discussed previously, OLS estimations with clustered standard errors allow more robust correlation structures among hotel-level observations.

[25] 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.

[26] Wooldridge (1995, 2002) discusses this methodology in the context of controlling for correlated unobserved heterogeneity in nonlinear models (probit/tobit), where data demeaning also does not apply.

[27] Note that this approach assumes that observed and unobserved factors are additively separable. Petrin and Train (2010) 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 the fixed-effects estimator). All of these estimates, however, differ significantly from the elasticities estimated without any correction for unobservables.

TABLE 4—UNBALANCED SAMPLE: FRANCHISE STATUS TREATED AS EXOGENOUS

	Dependent Variable = log(RevPar)			Dependent Variable = log(Price)			Dependent Variable = log(Occupancy Rate)		
		Controlling for Hotel Unobserved Correlated Heterogeneity[a]			*Controlling for Hotel Unobserved Correlated Heterogeneity*[a]			*Controlling for Hotel Unobserved Correlated Heterogeneity*[a]	
	OLS	OLS	RE	OLS	OLS	RE	OLS	OLS	RE
Franchised	−0.046***	−0.039**	−0.042***	−0.022**	−0.018*	−0.013	−0.013	−0.007	−0.013
	[0.017]	[0.017]	[0.014]	[0.011]	[0.011]	[0.010]	[0.009]	[0.009]	[0.011]
Lagged Occupancy				0.142***	0.044***	0.043***			
				[0.013]	[0.005]	[0.005]			
Lagged price							0.306***	0.218***	0.206***
							[0.029]	[0.022]	[0.022]
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]	[0.070]	[0.015]	[0.028]	[0.028]	[0.012]	[0.041]	[0.041]
Hotel age	0.081***	0.240***	0.222***	0.004	−0.022***	−0.005	0.057***	0.193***	0.168***
	[0.011]	[0.022]	[0.020]	[0.007]	[0.008]	[0.007]	[0.007]	[0.019]	[0.018]
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]	[0.028]	[0.017]	[0.017]	[0.017]	[0.015]	[0.015]	[0.016]
Air conditioning	0.103***	0.100***	0.087***	0.067***	0.064***	0.067***	0.013	0.006	−0.000
	[0.020]	[0.020]	[0.020]	[0.012]	[0.011]	[0.012]	[0.011]	[0.011]	[0.011]
Outdoor café	0.042*	0.043*	0.036	0.02	0.018	0.003	0.011	0.010	0.014
	[0.024]	[0.024]	[0.024]	[0.015]	[0.015]	[0.017]	[0.014]	[0.013]	[0.014]
Fitness facility	0.145***	0.144***	0.152***	0.053*	0.037	0.047	0.058**	0.059**	0.066***
	[0.044]	[0.044]	[0.045]	[0.032]	[0.032]	[0.032]	[0.024]	[0.023]	[0.023]
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]	[0.019]	[0.020]	[0.021]	[0.021]
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]	[0.011]	[0.006]	[0.003]	[0.003]	[0.009]	[0.009]	[0.009]
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]	[0.015]	[0.007]	[0.004]	[0.004]	[0.010]	[0.011]	[0.011]
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]	[0.020]	[0.010]	[0.006]	[0.006]	[0.012]	[0.014]	[0.015]
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]	[0.027]	[0.013]	[0.009]	[0.009]	[0.013]	[0.019]	[0.019]
Constant	0.276	0.177	0.262	0.988***	0.458**	0.584***	3.091***	2.900***	3.000***
	[0.318]	[0.327]	[0.339]	[0.185]	[0.197]	[0.209]	[0.186]	[0.198]	[0.201]
Brand fixed effects	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***
Observations	39,226	39,226	39,226	37,936	37,936	37,936	37,936	37,936	37,936
Number of hotels	1,194	1,194	1,194	1,194	1,194	1,194	1,194	1,194	1,194
R^2	0.74	0.75	0.75	0.93	0.93	0.93	0.42	0.44	0.44

In all specifications, standard errors, in brackets, are corrected for heteroskedasticity and hotel-level clusters. Significant at *10%, **5%, and ***1%. All specifications include dummy variables for 6 brands, 33 month-year 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).

an implication that is also visible in the first three columns of table 4.[28]

While the impact of the franchising dummy variable on prices and RevPar is negative and statistically significant in most 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 the hotel is franchised or not. Specifically, while being franchised reduces RevPar on average by around 4% and prices by about 2% compared to corporate hotels, offering air conditioning increases RevPar by about 10% and prices by 6% to 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 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) versus almost no (= 0) tourism intensity in a given month generates differences in all three outcomes at least ten times larger (columns 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 in a given month when they experience high occupancy rates in the prior month. These effects are smaller when we control for hotel-level correlated heterogeneity in columns 5 and 6. Still, a 10% increase in occupancy rate in the last month, which in our sample corresponds to a 7 percentage point increase given a mean occupancy rate of 70%, is associated with a 0.4% higher price in the current month. Similarly, a high price in the last month is associated with a sizable increase in current occupancy rate, as shown in columns 7 to 9. In general, the effects of lagged occupancy rates and prices support our arguments concerning 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 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 (such as a hotel going through major remodeling) that we do not observe in the data and changes over time in unobserved hotel-level characteristics (such as changes 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 (across all brands) that are franchised in the same market in any given month as our main instrument. This variable reflects (to us) unobserved company costs of choosing a particular organizational form locally and thus should influence the choice of organizational form for hotel *i*. Prior research has shown that franchising tends to be used more frequently in more rural or farther-away markets, or other markets that are less familiar to a franchisor because of different demographics (such as presence of certain ethnic groups), regulations (such as different tax laws across jurisdictions), culture (such as need for a different language in certain areas), and so on.[31] Under such circumstances, franchisees can help franchisors adjust better to the local market. Our data on average distance to headquarters in table 3 support the contention that local franchisees are useful to a franchisor in farther-away markets.[32] Moreover, Kalnins and Lafontaine (2004) show that franchisors cluster the outlets of their franchisees geographically. Similarly, and for similar reasons according to their study, corporate outlets 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.

[28] 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 reestimated the results for RevPar using the reduced sample of 37,936 observations. The results were consistent with those reported here.

[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 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 should also affect performance directly.

[30] Our goal is to correct for what is called the "endogenous dummy variable" problem. As suggested in Heckman (1978, 1990) and Wooldridge (2002), 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.

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

TABLE 5—IV ESTIMATIONS, FRANCHISE STATUS TREATED AS ENDOGENOUS

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 café	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	39,226	37,936	37,936
Number of hotels (clusters)	1,194	1,194	1,194

This is an unbalanced sample; all specifications control for hotel unobserved correlated heterogeneity. In all specifications, standard errors, in brackets, are corrected for heterostedasticity and hotel-level clusters. Significant at: *10%, **5%, and ***1%. All specifications include dummy variables for 6 brands, 33 month-year 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. 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).

We argue that this variable is a valid instrument because it affects the decision to franchise a hotel locally, as explained above, but also because it does not affect the performance of a specific hotel directly. There are several reasons for this. First, this variable 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 the hotels of the company, will affect demand at the focal hotel. Third, given that hotel ownership does not enter customers' preferences for rooms, there is no reason for a manager at hotel i to react differently to the competitive threat posed by franchised and corporate hotels in his or her market. This again is especially true given that the proportion of franchised hotels, as we measure it, is constructed across all the brands of the company in the market, and we already control for 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 franchised versus corporate outlets 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 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 and address uncorrelated heterogeneity by correcting standard errors for hotel-level clusters.[35]

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.[36] The estimated coefficients for other variables remain very similar to those we obtained

[33] In some cases of multi-outlet ownership (an issue we discuss in section IVC), 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-outlet owner. Moreover, we already control for the potential market power of a franchisee that could also affect hotel performance using 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 corporate 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. 2009a).

[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] Table A1 (see appendix) shows first-stage regression results for all three dependent variables. In these regressions, 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. In his discussion of robust tools of inference, Stock (2010) further emphasizes this test and points out that "then one can treat the instruments as sufficiently strong." Murray (2006), moreover, 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 (2002) test rejects the null hypothesis of weak IV, inferences based on 2SLS estimates and standard errors should be valid. Murray 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 the 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 (clusters) instead of the number of observations in such calculations.

under OLS and RE estimation 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 using 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 (by the econometrician) market and firm characteristics, they are able to achieve similar outcomes in terms of prices and performance across all their outlets.[37] This is perhaps to be expected when a firm that would find, for example, that prices in any of its franchised outlets were higher than it would like, or revenues lower than what it can achieve in corporate hotels, could remedy this situation by choosing to buy back the property and operate the hotel corporately instead. Indeed, in the hotel industry, franchise companies can (and do) terminate franchise contract during the contract period if the franchisee underperforms relative to the company's expectations—for example, when the franchisee is not bringing in sufficient levels of revenue.[38] The fact that we see very few changes in organizational form during the almost three years of our data suggests that the company is rather satisfied with the results it obtains under its current set of organizational choices.[39]

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

B. Testing for Nonlinear Effects of Organizational Form

So far we have looked for performance differences that would take the form of intercept shifts. In this section, we 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) because our data in table 3 suggest that franchised and corporate hotels are different along these dimensions in particular.[40] From a theoretical perspective, performance differences between franchised and corporate hotels might increase with hotel age as the franchisee becomes more experienced. In fact, 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 the performance difference between franchised and corporate hotels would increase with hotel age. Performance differences between franchised and corporate hotels may also increase or decrease with hotel size. In particular, agency theory suggests that franchisees, as local owners, should be better at overseeing and managing staff, a task that is expected to be more problematic in larger hotels. The empirical literature, however, suggests that franchising is used more for smaller rather than larger outlets.[41] 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 five years).

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. Since organizational form is an endogenous variable, the cross-effects are also endogenous, so we include only one cross-effect at a time and rely on two instruments: 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.[42] The results from our second-stage regressions, in table 6, show that neither the franchising dummy nor its cross-terms has a significant effect. In other words, 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

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

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

[39] Though one might think that the company instead could tailor the franchise contract to the characteristics of the hotel or the market, in reality these firms set the terms of their franchise contracts at the brand level and do not tailor to specific hotels. In fact, as Lafontaine and Slade (2007) noted, the empirical literature has shown that it is the extent to which firms rely on franchising or not, rather than the terms of franchise contracts, that is more responsive to differences in firm and market characteristics.

[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 franchised hotels are found in markets with very similar population and income levels (see table 3). Since we 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] See Lafontaine and Slade (2007).

[42] 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.

TABLE 6—TESTING FOR NONLINEAR 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 (hotel 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 café	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	39,226	39,226	37,936	37,936	37,936	37,936
Number of hotels (clusters)	1,194	1,194	1,194	1,194	1,194	1,194

See the notes for table 5.

previous results of no performance differences between the two organizational forms.[43]

C. 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.[44] 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 subsample of 1,072 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.

Brand subsamples. All our regressions include brand dummy variables to control for differences between brands. However, given the variation in table 2, one might wonder whether performance differences due to organizational form and the effect of other variables might differ across 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. Though not shown, the results once again support our conclusion of no significant performance or price differences between franchised and corporate hotels. We also found the impact of other variables in these regressions to be quite consistent with those in table 5. In other words, the pooling of data across brands does not drive any of our results.

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. How-

[43] When we include the cross-effects with size (columns 2, 4, 6), the coefficient of the 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.

[44] Among these, 91 hotels enter after the start of our sample period and 13 hotels drop out before the end. Thus, exit is very rare in our data. In fact, given that the hotels in question all disappear from our data less than one year before the end of our sample, they could represent simply missing data (due to delays in reporting to company headquarters) rather than exits. Given that the life cycle of a hotel is quite long (due to the large investment involved), hotel exits/closures are generally rare (see Freedman & Kosová, 2012, on this).

ever, for completeness, we also reestimated our performance equation using hotel monthly revenues as the outcome measure. The results (not shown) confirmed our findings in that franchised hotels on average did not show significantly different monthly revenues compared to corporate hotels.

Controlling for multi-outlet ownership. Some studies in the franchising literature examine how multiple-outlet ownership by franchisees can alter the effect of franchising on performance (Brickley, 1999; Kalnins & Lafontaine, 2004; Thomadsen, 2005). They suggest that franchisees with a higher number of franchised outlets may not be able to monitor manager behavior in their outlets any better than the franchisor can. This could lead to worse outcomes for franchised outlets 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 reestimated all regressions controlling for multi-outlet ownership as captured by the number of other hotels of the company that a franchisee owns (calculated across all the company's brands).[45] These analyses again confirmed our findings: across all the specifications for both balanced and unbalanced data, we found that multi-outlet ownership had no significant impact on performance, so 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 of the company's costs of using different organizational forms as instruments: the (log of the) total number of hotels of the company in the market, franchised or not (Hotel Density) and the log distance of the hotel to company headquarters.[46] If, for example, the company's monitoring costs are lower in markets where the firm already operates many other hotels, perhaps because it is less costly to obtain relevant information in such markets, then it should be less problematic to operate more of its hotels corporately in such markets.[47] In addition, agency theory suggests that greater distance to company headquarters should increase the need for franchising, because the costs of monitoring farther-away outlets are greater, and franchisees 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.[48] We believe that both of these variables can be excluded from our performance equation because we already control for market and hotel characteristics that may affect performance directly via our numerous control variables, including brand, competition, and monthly dummy variables, and we control for unobserved hotel heterogeneity.[49]

Since both instruments rely primarily on cross-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 appendix table A4, again confirm our previous findings: once we endogenize organizational form, we find no significant differences in pricing or performance between franchised and corporate hotels.[50]

Quantile regressions. 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 or 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, there is slightly higher variation in occupancy rates across franchised hotels.

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

[45] Recall that we observe ownership only 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's (1978) approach.

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

[47] Alternatively, the firm might experiment in new markets with corporate 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.

[48] See Lafontaine and Slade (2007) for a survey of evidence on franchising showing that more geographically dispersed franchised chains tend to use franchising more. Also, see Kalnins and Lafontaine (2013) for evidence that distance from monitoring headquarters reduces the survival of business outlets. One way to counter this effect is to franchise farther-away outlets, thereby effectively reducing the distance between owner headquarter and the outlet.

[49] Note that the company's headquarters 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.

[50] 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.

[51] As Chernozhukov and Hansen (2006) mentioned, practical estimation and inference methods for instrumental quantile regressions are complex and still being explored. At the same time, treating the franchising dummy variable as exogenous ensures that results from our quantile regressions are not driven by the choice of instruments.

TABLE 7—QUANTILE REGRESSIONS: FRANCHISE STATUS TREATED AS EXOGENOUS

	Dependent Variable = log(RevPar)			Dependent Variable = log(Price)			Dependent Variable = 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 café	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	39,226	39,226	39,226	37,936	37,936	37,936	37,936	37,936	37,936
Number of hotels	1,194	1,194	1,194	1,194	1,194	1,194	1,194	1,194	1,194
Bootst rapped replications	50[a]	50[a]	50[†]	100	100	100	100	100	100
Pseudo–R^2	0.50	0.55	0.56	0.78	0.79	0.77	0.30	0.28	0.25

This is an unbalanced sample; all specifications control for hotel unobserved correlated heterogeneity. Bootstrapped standard errors in brackets. Significant at *10%, **5%, and ***1%. All specifications include dummy variables for 6 brands, 33 month-year 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. 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).

[a] Higher numbers of replications (we tried 100 and 200) led to convergence problems.

coefficients of the franchising dummy variable do not reflect the average or 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 obtain the variance-covariance matrix.[52] We use 100 replications for occupancy and price but, due to convergence problems, only 50 replications for RevPar.

Results, shown in table 7, again support our earlier conclusions: the differences in performance and pricing attributable to franchising as organizational form are either statistically insignificant or, in the few cases of statistical significance, 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 regression, 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 the 75th percentile. This represents a difference of only 0.49 euros (at 70.14 euros for the 75th percentile 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 in our OLS estimations, we find that whether a hotel has a fitness facility or faces high tourism intensity, for example, generates a 9% (more than ten times larger) positive difference in prices. In other words, the pre-

[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.

sence of a fitness room in a franchised hotel at the 75th percentile of the price distribution more than outweighs any price difference attributable to franchising as organizational form. For occupancy rates, the most sensitive to franchising seems to be the 25th percentile. But even among these low-occupation hotels, franchised hotels show only about 1% lower occupancy rates than corporate hotels relative to an occupancy rate of 60.6% for the 25th percentile in our sample. Finally, RevPar seems most sensitive to organizational form, but 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 with more replications, they would imply negative differences for franchised hotels of between 1% and 3% for RevPar for the three quantiles. This again is a slightly smaller impact than the mean difference, of 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.

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. This suggests that our previous mean-focused estimations, in particular, our IV results where we can fully endogenize organizational form, should yield robust and reliable conclusions regarding the impact of franchising versus corporate ownership on performance.

V. Conclusion

Using proprietary monthly panel data from a large multichain hotel company, we examine the impact of organizational form, franchised versus corporate, on hotel-level outcomes: RevPar, Occupancy Rates, and Price. In the raw data, we find significant differences—higher prices and lower occupancy rates among franchised than among corporate hotels. Once we control for hotel and market characteristics and for self-selection bias due to hotel unobserved correlated heterogeneity, we find lower rather than higher prices and lower revenues per available room (RevPar), but similar occupancy rates, in franchised compared to corporate hotels. In addition, the differences in prices and RevPar become very small relative to those associated with 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 are 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 are either insignificant or even smaller than those suggested by OLS estimates.

Finally, we find 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 on performance have suffered from a lack of good instruments in general. Because our data are comprehensive when it comes to the company's operations, however, we have access to information on its governance decisions for other hotels in the same markets. We show that this variable is a valid instrument in our context and hope that this will encourage other authors to look for similar types of instruments in future analyses of the effects of governance.

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 robust across various specifications. 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, it achieves consistent results in terms of outcomes it cares about, namely RevPar, occupancy rates, and prices, across both sets of hotels.

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, organizational form decisions in large, mature multinational firms such as our company should be made optimally. 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 simply do so. However, if different organizational forms coexist because the option to organize transactions in different ways helps firms circumvent various agency or market obstacles, as the literature on the choice of organizational form emphasizes, we should not be surprised to find that after controlling for factors that affect this decision, organizational form itself does not give rise to different outcomes. These outcomes simply will be achieved in different ways. Where we might expect to see differences, then, is in intermediate decisions and strategies (such as amount of labor or compensation practices) implemented differently across organizational forms (see Krueger, 1991; Freedman & Kosová, forthcoming) to achieve the same desired outcome in the end.

Results on the effect of organizational form on firm performance in the literature have mostly been obtained in settings where firms have been constrained either by policy or

[53] Though twenty 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.

by other features of their environment, (such as unions), to rely on specific organizational forms they might not have chosen otherwise. This literature has found that firms perform less well under these circumstances. Our results, on the other hand, were obtained in an unconstrained setting. Thus, in a broad sense, comparing our results to those in the literature, we can conclude that policies and features of the environment that constrain firm choices of organizational form indeed can affect firm performance in important ways.

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TABLE APPENDIX

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

Second-Stage Dependent Variable	log(RevPar)	log(Price)	log(Occupancy Rate)
IV: Proportion of company's other hotels in local market 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 café	−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]	[0.565]	[0.530]
Brand fixed effects	Yes***	Yes***	Yes***
Observations	39,226	37,936	37,936
Number of hotels	1,194	1,194	1,194
F-statistics on significance of IV	33.98***	33.60***	34.69***
Adjusted R^2	0.43	0.43	0.43

First-stage regressions show the results from the linear probability model estimated by standard 2SLS procedure (we report the second-stage results for the performance equation in table 5). Standard errors, in brackets, are corrected for heteroskedasticity and hotel-level clusters. Significant at *10%, **5%, and ***1%.

All 1st-stage regressions include the other variables included (but unreported) in the second-stage regressions, namely: dummy variables for 6 brands, 33 month-year 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 second stages: number of rooms, age, and tourism intensity dummy variables. Also, when the dependent variable in the second stage is price (or occupancy rate), we include the mean of lagged occupancy rate (price).

TABLE A2—BALANCED SAMPLE, FRANCHISE STATUS TREATED AS EXOGENOUS

	Dependent Variable = log (RevPar)			Dependent Variable = log(Price)			Dependent Variable = log(Occupancy Rate)		
		Controlling for Hotel Unobserved Correlated Heterogeneity			*Controlling for Hotel Unobserved Correlated Heterogeneity*			*Controlling for Hotel Unobserved Correlated Heterogeneity*	
	OLS	OLS	RE	OLS	OLS	RE	OLS	OLS	RE
Franchised	−0.051***	−0.044**	−0.040***	−0.026**	−0.023**	−0.012	−0.011	−0.004	−0.010
	[0.018]	[0.018]	[0.015]	[0.011]	[0.011]	[0.011]	[0.010]	[0.009]	[0.011]
Lagged occupancy				0.155***	0.039***	0.039***			
				[0.014]	[0.004]	[0.004]			
Lagged price							0.313***	0.197***	0.197***
							[0.031]	[0.023]	[0.023]
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]	[0.050]	[0.016]	[0.034]	[0.034]	[0.012]	[0.038]	[0.038]
Hotel age	0.060***	0.133***	0.133***	0.015	0.007	0.007	0.029***	0.090***	0.090***
	[0.015]	[0.023]	[0.023]	[0.009]	[0.012]	[0.012]	[0.008]	[0.021]	[0.021]
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]	[0.029]	[0.018]	[0.017]	[0.018]	[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]	[0.021]	[0.013]	[0.012]	[0.014]	[0.011]	[0.011]	[0.010]
Outdoor café	0.03	0.033	0.022	0.020	0.019	0.002	0.003	0.002	0.003
	[0.025]	[0.024]	[0.026]	[0.016]	[0.015]	[0.018]	[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]	[0.036]	[0.025]	[0.025]	[0.024]
Population	0.044***	0.040***	0.041***	0.020***	0.017***	0.018***	0.013***	0.008**	0.008**
	[0.008]	[0.008]	[0.008]	[0.005]	[0.005]	[0.005]	[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]	[0.033]	[0.019]	[0.019]	[0.020]	[0.020]	[0.021]	[0.021]
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]	[0.011]	[0.006]	[0.003]	[0.003]	[0.009]	[0.009]	[0.009]
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]	[0.014]	[0.007]	[0.004]	[0.004]	[0.010]	[0.011]	[0.011]
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]	[0.019]	[0.010]	[0.006]	[0.006]	[0.012]	[0.015]	[0.015]
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]	[0.024]	[0.014]	[0.007]	[0.007]	[0.013]	[0.019]	[0.019]
Constant	0.122	0.031	−0.0001	0.879***	0.256	0.276	3.056***	2.863***	2.902***
	[0.319]	[0.329]	[0.329]	[0.191]	[0.207]	[0.216]	[0.189]	[0.201]	[0.200]
Brand fixed effects	Yes**	Yes**	Yes**	Yes**	Yes**	Yes**	Yes**	Yes**	Yes**
Observations	36,448	36,448	36,448	35,376	35,376	35,376	35,376	35,376	35,376
R^2	0.76	0.76	0.76	0.93	0.94	0.94	0.44	0.46	0.46
Number of Hotels	1,072	1,072	1,072	1,072	1,072	1,072	1,072	1,072	1,072

See the notes to table 4.

TABLE A3—IV ESTIMATIONS, FRANCHISE STATUS TREATED AS ENDOGENOUS

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 café	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	36,448	35,376	35,376
Number of hotels	1,072	1,072	1,072

This is a balanced sample: All specifications control for hotel unobserved correlated heterogeneity. See the notes to table 5.

TABLE A4—IV ESTIMATIONS WITH ALTERNATIVE INSTRUMENTS FOR FRANCHISE STATUS: HOTEL DENSITY + DISTANCE TO FRANCHISOR'S HEADQUARTERS

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 café	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	39,226	37,936	37,936
Number of hotels	1,194	1,194	1,194

This is an unbalanced sample. All specifications control for hotel unobserved correlated heterogeneity. Both instruments are in logs. For other notes, see table 5.