Chapter 5

Internal Features and Agglomeration Externalities for the Hotels' Competitiveness in Emilia-Romagna

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1. Introduction

The debate on the relationships among firm performance, heterogeneity, and agglomeration began many decades ago. Since the work of Penrose (1958), firm heterogeneity in resources and competences has been employed to explain the achievement of different levels of profitability. Wernerfelt (1984) demonstrates that the partial interfirm mobility of the different resources and capabilities are central in explaining the maintenance of competitive advantages. Moreover, the relationship between agglomeration (localization and urbanization) and productivity has spurred a vast amount of research (Rosenthal and Strange, 2004), thus providing extensive evidence of increasing returns to urban density and industry size for manufacturing industries. Focusing on different manufacturing sectors, the Italian Office of Statistics (ISTAT) has recently evidenced strongly heterogeneous dynamics in firm productivity, especially among firms belonging to different spatial clusters (ISTAT, 2014).

In tourism, while the study of the relationships between hotel performance and territorial characteristics is more recent, it is challenging given the strong connection between market size and destination policy, planning and development (Crouch and Ritchie, 1999; Ritchie and Crouch, 2003), and competitiveness. The rationale relies on the tourists' decision-making-process. The tourist's choice of a destination is driven by "external factors" such as natural and cultural resources, tourism infrastructure, and environmental characteristics. Moreover, hotels' (internal)

M. M. Mariani et al. (eds.), *Tourism Management, Marketing, and Development*

characteristics and the organization of their resources determine the choice of a certain accommodation structure (Molina-Azorin et al., 2010).

This chapter investigates how external (agglomeration) and internal factors affect the productivity and efficiency of the enterprises belonging to the NACE 55.1 industry (accommodation). We consider macro and micro determinants in a single stochastic frontier function estimated using firm-level data. The approach is coherent with the literature on determinants of firm competiveness as it allows for the distinction between internal factors—reflecting the heterogeneous characteristics of individual business establishments—and external factors, either localization economies external to firms but internal to the industry or urbanization economies external to the firm and the industry but internal to the cities.

We focus on the Emilia-Romagna, an Italian administrative region (Nuts 2 region) in the center-northern portion of Italy with a population of 4.117 million people and a per capita income of €31,000, which places it in fourth place in Italy and fifty-third in Europe (source: Eurostat, Regional statistics database). The region has a strong vocation for tourism, offering a wide range of tourism products (seaside, mountain, thermal, artistic, and business tourism).

The regional focus is motivated by the current Italian institutional setting where regions are the principal subjects responsible for appropriately preparing the territory to enhance competitiveness. In this framework, we consider small areas (municipalities) as the spatial measurement unit because they permit the study of the relative impact of localization and urbanization economies. The source and the outcome of these agglomeration economies are quite similar within narrowly defined industries (Duranton and Puga, 2004); thus, following Rosental and Strange (2003), we attempt to identify these sources and outcomes limiting the spatial dimension on which the two agglomeration economies are measured.

This study expands on previous empirical research on agglomeration economies in four directions. First, following Tveteras and Battese (2006), we separate agglomeration effects (common to firms located in the same municipality) from internal effects on competitiveness, and thus avoid the aggregation biases associated with firms' different internal returns to scale. Second, we consider the effects of agglomeration economies on the production frontier and on technical inefficiency, estimating them simultaneously. Third, we focus on the relative strength of urbanization and localization effects using small area (municipality) data. Fourth, considering a wide sample of 2,705 hotels, we provide empirical evidence that the hotel industry is important for the territory, though it has been less explored than the manufacturing industry.

The chapter is structured in the following way. In section 2 a presentation of the agglomeration effects on productivity and efficiency is made. The next section presents the case study and the data, followed by the presentation and discussion of the methodology of the study. Empirical findings are reported in section 5. Some final remarks are left for the concluding section.

2. Agglomeration Effects on Hotel Production and Efficiency

In the field of tourism, firms tend to be concentrated in particular areas, forming a well-defined geography of local productive systems (Capone and Boix, 2008). The links between hotel competitiveness and destinations are expected to be intense, especially in countries such as Italy, where hotel proprietorship is diffuse, hotel chains are concentrated in large cities, and the diffusion of large tour operators is hampered by the small average size of accommodation structures. In such a fragmented market, the production of commodities and services, destination marketing, and the development of new products all require economic and organizational resources that an individual firm is usually unable to provide (Hong, 2009). This reinforces the importance of regional policies to create the contextual conditions and allow hotels to increase their level of competitiveness (Hu and Wall, 2005, Lopez-Gamero et al., 2009). Some of the extant literature relates firm productivity to the characteristics of the location in which the firm operates. Marshall (1920) examines three mechanisms through which the geographic concentration of firms may raise their performance: input sharing, labor-market pooling, and knowledge spillover. The rationale is that the geographical clustering of businesses may stimulate the development of upstream industries that are able to provide specialized inputs, boost the development of relatively large pools of labor-embodying skills, and enhance the flow of knowledge intra-firms, with consequent positive impacts on productivity. Later, Hoover (1937) distinguishes between urbanization and localization economies. The latter are benefits yielded by the local concentration of firms in the same industry, while urbanization economies are advantages generated by the urban environment as a whole. Subsequent literature notes that urbanization economies do not depend only on urban size but rely also on diversity (Jacobs, 1969) and infrastructures (Camagni, 1992).

Although most of the studies focus on the manufacturing sector, the localization economies affected by technological spillovers and/or spillovers of tacit knowledge are common within clusters of tourism firms (Hallin and Marnburg, 2008). One common characteristic of hospitality companies is that their service processes are knowledge-based or knowledge-intensive due to the great influence and use of information and communication technology (Kahle, 2002). Moreover, the accommodation structures operating in close spatial proximity are subject to the same stochastic seasonal demand patterns, and seasonality plays a central role in conditioning how operations are organized and people are managed (Baum and Szivas, 2008).

These externalities also occur in urbanization economies. The co-location of many complementary providers adds value to the tourism experience and increases tourist satisfaction. Hotels can create alliances and networks with firms and thus produce complementary products and services, thereby better exploiting local skills and resources (network economies). This cooperation gives rise to innovative business activities and the development of specialized regional products (Bernini, 2009; Michael, 2003; Novelli et al., 2006).

Clusters of accommodation structures are also expected to create both a pooled market for workers with specialized skills needed in the tourism industries (Hong, 2009) and increases in the birth and death of firms specializing in the provision of intermediate inputs. These effects are particularly important in the Italian context where the hospitality industry has a high employee turnover rate and people show a high propensity toward entrepreneurship (i.e., 116 companies per 1,000 inhabitants aged between 15 and 74). Accordingly, hotels have easy access to either a deep pool of labor or specialized suppliers, both of which support gains in productivity and promote efficiency. Agglomeration may also produce positive effects on rent for accommodation firms provided they can create complementary differences with respect to size (Baum and Haveman, 1997). Chung and Kalnins (2001) find that the presence of closely located chain hotels and larger hotels represents a positive externality for independent hotels and smaller hotels.

Finally, in an industry such as tourism, urbanization diseconomies exist, which may balance the expected positive advantages of agglomeration on hotel performance. Diseconomies are connected to congestion externalities and conflicting preferences among tourists and residents (Concu and Atzeny, 2012). In general, the role played by urbanization (dis)economies is not well defined and is frequently mixed up with localization economies (Eberts and McMillen, 1999; Graham, 2009). Rosenthal and Strange (2003) find that localization economies decrease rapidly across space, emphasizing that only with a spatially detailed sample of firms is it possible to identify the relative impact of localization and urbanization economies.

The literature on hotel efficiency based on frontier models and spatial agglomeration effects has increased. Several papers have investigated the effects of internal and agglomeration drivers on firm efficiency using a two-step procedure. Among others, De Jorge and Suarez (2014) find significant effect due to a territorial dummy variable (capturing the effect of hotel locations in different Spanish regions). They connect differential efficiency between hotels located in different regions to the differential in tourism demand size due to product specialization or better climate conditions. Barros (2005) demonstrates positive effects on hotel efficiency when located near a main route or in a city. A negative significant correlation between efficiency and the hotel distance from the main airport in Lisbona is also reported. With respect to Japanese hotels, Honma and Hu (2013) show a similar result regarding hotel distance from the nearest airport, while other agglomeration effects appear insignificant. Wang et al. (2006) show evidence for better performance that it is related to the proportion of individual foreign travelers in Taiwan. Bernini and Guizzardi (2010) find higher efficiency in business corporations located in Italian cities known for their art, as these cities are usually multi-opportunity destinations that host different segments of the tourism population. In seaside destinations, where it is not uncommon to observe a seasonal higher demand with respect to accommodation capacity, the estimated effect is lower but still positive and significant.

In summary, the relationship between localization and urbanization economies and hotel efficiency is a rather complicated issue. The complexity becomes more severe because of the negative externalities that exist and because destination and firm competitiveness are mutually dependent. To our knowledge, no empirical

studies have yet considered the simultaneous effects that the location in a municipality has in differentiating either the hotel production processes or the efficiency level of hotels.

3. The Case Study

This analysis focuses on the Emilia-Romagna (ER) region because it is one of the most important tourism destinations in Italy. Official data state that in 2005, hotel production in the region consisted of 29 million overnight stays, corresponding to 12 percent of the national market (ISTAT 2007). The market share falls to 9.8 percent for arrivals, depicting the region as a destination for "long vacations" (see Table 5.1).

ER is also an important area for tourism supply as 15 percent of the national accommodation enterprises and 15 percent of the accommodation workers are employed in the region. Finally, with its territorial characteristics and natural and anthropological features, the region offers a wide range of tourism products (seaside, mountain, thermal, artistic, and business tourism), and accommodation firms cover the full range of tourism activities. Such territorial differences support our aim to investigate the role of spatial characteristics on hotel efficiency.

Data for the ER region are available through the Fiscal Sector Study (FSS). FSSs are an administrative database instituted by the Italian Tax Authority in 1996 to determine, within each industry, adequate annual fiscal return for each enterprise based on accounting data, employment, structural facilities, and implemented productive processes. FSSs collect information from micro and small enterprises. The economic subjects qualified to compile questionnaires are firms, artisans, and the self-employed whose annual turnover ranges from €25,000 to €5,160,000. As a counterbenefit for a return declaration evaluated as adequate, these economic subjects are made free of Tax Authority income investigation. The FSS database provides both standard balance-sheets accounting data and a highly detailed description of inputs used in the production processes. As regards labor, the FSSs offer information on the number of working days of the several typologies of employees; capital

Table 5.1 Top Five Regions in Terms of Overnight Stays (2005)

Nuts 2 Regions	Tourist in Hotel		Market Share	
	Arrivals	Overnights	Arrivals	Overnights
Trentino-Alto Adige	6.391.936	32.151.606	8,9%	13,4%
Emilia-Romagna	7.052.271	28.886.289	9,8%	12,0%
Veneto	8.850.841	27.174.759	12,3%	11,3%
Lazio	8.750.847	26.444.508	12,1%	11,0%
Lombardia	8.998.800	21.253.264	12,5%	8,8%
Toscana	7.643.461	21.026.319	10,6%	8,7%
Others	24.530.948	83.498.471	34,0%	34,7%

Table 5.2 Population Structure and Sample Coverage (2005)

	Population Source (Istat)		FSS Sample Used in the Analysis Source (FSS)		Coverage of the Sample Used in the Analysis	
	Establishment	**Beds**	**Establishment**	**Beds**	**Establishment**	**Beds**
1*	730	19552	266	8745	36%	45%
2**	1347	54397	677	33518	50%	62%
3***	2306	158049	1567	126305	68%	80%
4****	304	38524	193	24716	63%	64%
5*****	7	1208	2	349	29%	29%
Total	4694	271730	2705	193633	58%	71%

Table 5.3 Destination Characteristics with Respect to Capital and Labor (Mean Values)

	Nr. hotels	**Nr. Beds**	**Nr. Added Beds**	**S_mt F&B**	**S_mt halls**	**S_mt Facilities**	**Employees (nr. days worked)**	**Family (nr. days worked)**	**Managers (nr. days worked)**
Minor municipalities	200	59	5	122	85	50	1,303	619	146
Major Towns	111	87	5	64	96	63	2,810	594	318
City of Arts	92	71	8	131	142	111	1,717	530	171
Hill localities	5	62	9	170	67	–	775	617	60
Seaside localities	2,136	74	6	152	82	29	838	366	47
Mountain localities	57	45	4	122	74	19	557	501	40
Thermal localities	104	55	3	134	96	37	829	623	66
Total	2,705	72	5	144	85	35	976	413	71

is disentangled and information about the area occupied by thefirms as well as the services offered is available.

As for the accommodation industry (excluding motels and inns), the number of establishments returning a completed questionnaire in 2005 was 2,705 hotels, showing high coverage rates either for the number of establishments or beds (see Table 5.2).

The main advantage of FSSs is that they offer a wide range of information on the inputs used in the production process. With respect to labor, the number of working days for several types of employees is provided. In the analysis, we consider three labor inputs: managers (Managers), employees who are not managers (Employees), and individuals in another type of contractual relationship similar to the employment relationship, such as silent partners, administrators, or family members (Family). The capital inputs are measured by the number of beds (Nr Beds) and the number of

added beds (Nr Added Beds), thus accounting for beds that are added during seasonal peaks to those officially present. The capital not directly employed in guest accommodations is measured in terms of surface (square meters) and distinguishes between reception services (Halls), bar and restaurant services (F&B), and other services, such as conference rooms, sports facilities, swimming pools, and spas (Facilities).

These features are strongly related to the territory. By using the tourism municipality classification (ISTAT), the mean value of the labor and capital inputs are reported in Table 5.3. As evidenced, there are considerable differences among the different typologies of tourism and urban destinations regarding the inputs employed in the productive process, which suggests that territorial characteristics may play a role in the accommodation production process.

4. The Model

In this chapter, we consider external (agglomeration) and internal factors in a unique stochastic production function to investigate the relevance of these features in affecting the productivity and the (in)efficiency of hotels, and we suggest policy strategies to improve competitiveness. Moreover, following Tveteras and Battese (2006,) we differentiate between local agglomeration effect and the internal characteristics on firm efficiency, assuming that the agglomeration effect is common to firms located in the same city (or region).

The choice of a production function is motivated by certain considerations. First, a typical Italian hotel uses a part of the hotel as the entrepreneur's family home. Thus, accounting measures should not consider opportunity costs. Second, we investigate one output product, thus avoiding a multiproduct environment. Finally, we consider Italian tourism firms operating in a competitive market where inputs can be considered exogenous to the production function. Accordingly, the opportunity of a cost function approach decreases with respect to a production parametric approach.

The econometric model that is estimated in the chapter is specified with both a stochastic frontier production function and a technical inefficiency model (Battese and Coelli, 1995). In particular, we use a Cobb-Douglas production function:

$$\begin{aligned}\ln y_i = {} & \beta_0 + \beta_1 \ln \text{Employees}_i + \beta_2 \ln \text{Families}_i + \beta_3 \ln \text{Managers}_i \\ & + \beta_4 \ln \text{NrBeds}_i + \beta_5 \ln \text{NrAddedBeds}_i + \beta_6 \ln \text{F\&B}_i \\ & + \beta_7 \text{Halls}_i + \beta_8 \ln \text{Facilities}_i + \beta_9 D\_\text{Ann}_i + \beta_{10} D\_1\,\&\,2\text{Stars}_i \\ & + \beta_{11} D\_4\,\&\,5\text{Stars}_i + \beta_{11} D\_\text{ArtsMajoe}_i + \beta_{12} D\_\text{Tour}_i \\ & + (v_i - u_i) \quad i = 1,..,N_j\end{aligned} \tag{1}$$

where ln indicates the natural logarithm and y_i denotes the value added of hotel i defined as the revenue minus outside purchases (of materials and services). Inputs are described in the previous section. Differences in production process due to the

category as well as the seasonality of the hotel are controlled by means of several dummies. *D*_1&2Stars is a dummy variable that takes a value of 1 if hotel *i* belongs to the one- and two-star category; *D*_4&5Stars takes a value of 1 if hotel *i* belongs or the four- and five-star category; D_Ann_i assumes the value of 0 if hotel *i* is seasonal. Two additional dummies are introduced in the production functions, *D*_ArtMajor and *D*_Tour, to control for whether hotel *i* is localized in a city of arts or a major town or in a tourism destination (not a seaside municipality), respectively. These territorial-specific variables aim at capturing localization economies external to firms but internal to product segments (leisure, cultural, business, etc.), which may influence the productivity of the accommodation firms. We assume that differences in tourism product typologies reflect different territorial specializations in terms of demand size and seasonality pattern, pool of specialized labor, density in the location of the accommodation structures, co-location of complementary providers specializing in the provision of intermediate inputs, and the presence of specific infrastructure.

The v_is are random variables that are assumed to be independent and identically distributed, $N(0; \sigma_V^2)$. The nonnegative random variables, (u_i), which account for technical inefficiency in production, are assumed to be independently distributed, such that u_i is the truncation (at zero) of the $N(\mu_i; \sigma^2)$-distribution, where μ_i is a function of observable explanatory variables and unknown parameters, as defined below. We choose the truncated normal form because of the hypothesis that the market is competitive, that is, a greater proportion of the enterprises operates "close" to efficiency. It is assumed that the v_is and the u_is are independent random variables.

To measure how external and internal factors affect hotel inefficiencies, we propose a novel specification in which the mean μ_i is associated with the technical inefficiency effects and is assumed to be a function of hotel internal characteristics and city localization such that,

$$\begin{aligned}\mu_i = {} & \delta_0 + \delta_1 \ln \text{Inv}_i + \delta_2 \ln \text{Age}_i + \delta_3 \ln \text{NoOver}_i + \delta_4 \ln \text{Tour}_i \\ & + \delta_5 \ln \text{Extra}_i + \delta_6 D\_\text{Ann}_i + \delta_7 D\_1\,\&\,2\text{Stars}_i \\ & + \delta_8 D\_4\,\&\,5\text{Stars}_i + \delta_9 D\_\text{Tour}_i + \delta_{10} D\_\text{ArtsMajor}_i \\ & + \delta_{11} \ln \text{Stag}_i + \delta_{12} \ln \text{Density}_i + \delta_{13} \ln LQ_i + \delta_{14} \ln SF_i + \delta_{15} \ln FSR_i\end{aligned} \tag{2}$$

where δs are parameters to be estimated. A positive parameter value of δ_m implies that the mean technical inefficiency increases as the value of the *m* input variable increases. "Inv" is defined as the ratio between fixed assets and revenues, and it is used to control for the effect of investment of firm efficiency. We expect that hotels investing in fixed assets are more technically efficient (i.e., hotels with $u = 0$). "Age" is the number of years of operation of the hotel, and it is used to evaluate learning-by-doing effects on efficiency; "NoOver" is the percentage of days (in respect to the total number of opened days) without guests. "Tour" is the percentage of revenue due the tour operator and travel agency. "Extra" is the percentage of revenues due to additional services offered by the hotel (i.e., wellness, sports, etc.). As in the

production function, effects of star ratings and seasonality are addressed by dummy variables (*D*_1&2*Stars*, *D*_4&5*Stars* and D_Ann_i).

Following Tveteras and Battese (2006), the number of hotel per km^2, FSR_i, is used to account for localization effects tied to firm density denoted by the subscript *i*, which refers to the municipality in which the firm operates. In addition, we consider a measure of municipality specialization relative to the whole ER region given by $LQ_i = {H_i/ES_i}/{H_s/E_{s*}}$, where *H* is the number of establishments in the 55.1 NACE classification and E_s is the number of establishments. If *LQ* is greater than 1, it indicates that the municipality has a specialization (concentration) in hotel activities that is above the regional average. The proximity of hotels can influence efficiency in several respects (Nakamura, 2012). It should lead to a more efficient sharing of producer services and industry capital, such as port, railway station or local transport services, parking facilities, retail consumer services, and wholesale services. Moreover, high hotel density (specialization) should enhance knowledge transmission as well as diseconomy due to the competition from similar-sized hotels within the accommodation sector of the destination.

To investigate urbanization economies that are the result of knowledge spillovers among firms and entrepreneurships, we follow Capone and Boix (2008) and use the inverse of the firm dimension (SF) given by the ratio between the number of firms and the corresponding number of employees in the whole industry of the destination. We also introduce the population density (Density), which is given by the ratio of inhabitants to municipality surface (km^2) and the two dummies *D*_ArtMajour and *D*_Tour to control for Hoover's dimension effect and the infrastructures and attractions endowment, not having specific data to capture such urbanization effects. Finally, we consider the externality effect generated by the demand seasonality pattern at the destination using an indicator (Stag) calculated as the ratio between the overnight stays during the peak season (June to September) and the total overnight stays of the year. This variable, together with Density, is expected to capture the presence of urbanization diseconomies connected to congestion externalities and conflicting preferences among tourists and residents. Some descriptive statistics on variables used in the analysis are reported in Table 5.4.

The parameters of the frontier production function are simultaneously estimated with those of the inefficiency model (β, δ, σ^2, σ^2_v), in which the technically inefficiency effects are specified as a function of other variables. Maximum-likelihood estimates of the model parameters are obtained using the program FRONTIER 4.1 written by Coelli (1996). The technical efficiency of the *i*-hotel, $TE_i = e^{-u_i}$, is predicted as proposed in Battese and Coelli (1992).

The ML estimates of the parameters in the stochastic frontier production function, given the specifications for the technically inefficiency effects defined by equations (1) and (2), are given in Table 5.5. The estimated β coefficients of the stochastic frontier and estimated δ coefficients in the inefficiency model have signs and sizes that conform to our expectations; a discussion of technical inefficiency scores, elasticities, and economies of scale are reported in the next section.

With regard to the nature of the technical efficiency, the general stochastic frontier model encompasses the following three subcases: (1) when $\gamma = \delta_0 = \delta_1 = \ldots = \delta_m = 0$,

Table 5.4 Descriptive Statistics of the Variables Used in the Analysis

Variables	Units	mean	sd	min	max
Output					
Value added	Euro (x1000)	72	48	9	642
Inputs					
Nr. Beds	Number	72	48	9	642
Nr. Added Beds	Number	5	10	1	160
S_mt F&B	square meters	144	111	2	1482
S_mt halls	square meters	85	127	8	4600
S_mt Facilities	square meters	35	136	1	2958
Employees	nr. days worked	976	1324	1	14158
Family	nr. days worked	413	287	0	4850
Managers	nr. days worked	71	178	1	2544
(In)efficiency Determinants: Internal to Hotel					
Age	Number	19.0	11.6	1.0	101.0
Inv	%	1.02	0.90	0.00	22.11
NoOver	%	4.1	8.5	0.0	100.0
Tour	%	18.2	23.4	0.0	100.0
Extra	%	4.2	8.7	0.0	97.0
D_ann	dummy	0.20	0.40	0.00	1.00
D_1&2Stars	dummy	0.35	0.48	0.00	1.00
D_4&5Stars	dummy	0.07	0.26	0.00	1.00
(In)efficiency Determinants: External to Hotel					
D_Tour	dummy	0.06	0.24	0.00	1.00
D_ArtsMajor	dummy	0.08	0.26	0.00	1.00
Stag	%	0.73	0.18	0.30	0.92
Density	Number	993.7	730.9	8.7	2670.5
LQ	Number	7.4	3.8	0.0	14.0
SF	Number	0.4	0.1	0.1	3.5
FSR	Number	11.8	11.6	0.0	43.9

there is no technical inefficiency (deterministic or stochastic) and the model collapses to the traditional average production function; (2) when $\gamma = 0$, technical inefficiency is not stochastic and the explanatory variables in equation (2) must be included in equation (1) along with inputs; (3) when all δ's (except the intercept term) are zero, the z's do not affect technical efficiency levels.

Hypotheses about the nature of the technical inefficiency can be tested using the generalized likelihood ratio statistic, λ, given by $\lambda = -2\left[\ln(L(H_0)) - \ln(L(H_1))\right]$, where $L(H_0)$ and $L(H_1)$ denote the value of the likelihood function under the null and alternative hypotheses, respectively. If the given null hypothesis is true, then λ has approximately a Chi-square (or a mixed Chi-square) distribution.

If the null hypothesis involves $\gamma = 0$, then the asymptotic distribution involves a mixed Chi-square distribution (Coelli, 1995). The LR test of the one-sided error for

Table 5.5 Maximum Likelihood Estimates for Parameters of the Stochastic Frontier and Inefficiency Effects Model

Coefficient	Estimate	Standard Error	t-Ratio
Stochastic Frontier			
Constant	6.454	0.139	46.418
No. of Beds	0.534	0.021	25.338
No. of added beds	0.063	0.017	3.795
S_mt F&B	0.005	0.008	0.616
S_mt halls	0.038	0.011	3.631
S_mt Facilities	0.034	0.017	1.981
Employees	0.195	0.006	30.228
Family	0.194	0.012	16.710
Managers	0.166	0.017	10.046
D_Ann	0.425	0.032	13.141
D_1&2Stars	–0.200	0.020	–9.844
D_4&5Stars	0.317	0.042	7.518
D_Tour	0.241	0.042	5.696
D_ArtsMajor	0.054	0.038	1.430
Inefficiency Model: Internal Determinants			
Constant	–6.308	1.226	–5.147
Age	–1.196	0.149	–8.048
Inv	–1.042	0.128	–8.149
NoOver	0.421	0.042	10.130
Tour	0.124	0.021	5.878
Extra	–0.404	0.055	–7.347
D_Ann	1.837	0.207	8.863
D_1&2Stars	0.514	0.086	6.005
D_4&5Stars	0.927	0.154	6.009
Inefficiency Model: External Determinants			
D_Tour	2.230	0.247	9.037
D_ArtsMajor	0.562	0.180	3.124
Stag	1.839	0.287	6.400
Density	–0.681	0.110	–6.207
LQ	–0.500	0.130	–3.836
SF	0.344	0.137	2.502
FSR	0.608	0.129	4.705
Variance Parameters			
	1.224	0.149	8.233
γ	0.919	0.011	82.996
Loglikelihood Function			
LL	–1293.780		
LR test of the one sided error	357.676		
Number of cross-sections	2705		
Number of time periods	1		

the null hypothesis of no technically efficiency is strongly rejected. The LR test is in fact equal to 266.65, which exceeds 19.94, the upper 5 percent point for the mixed Chi-square distribution with 17 degrees of freedom (Kodde and Palm, 1986). The value of the estimates of the γ-parameter is 0.92, which implies that a significant proportion of the total variability is associated with technical inefficiency of production. The null hypothesis that the explanatory variables in the model for the technical inefficiency effects have zero coefficients is also strongly rejected by the data (LR= 169.7).

5. Economic and Managerial Results

Elasticities and Return to Scale

The elasticities, obtained by summing the input parameter estimates reported in table 5.5, equal 0.555 and 0.669 for labor and capital, respectively, and thus the return to scale parameter is 1.224, which indicates that the accommodation sector in ER exhibits increasing return to scale. The result on the labor elasticity is quite unexpected because the accommodation industry is perceived as a labor-intensive sector. The rationale relies on the role of the dummy variable *D_ann*, which controls for the production process of the annual hotels. As evidenced in Bernini and Guizzardi (2012), a strong heterogeneity affects the technological sets of hotels with different levels of environmental features (i.e., size, seasonality, rating). In our estimates, we partially control for heterogeneity by means of the *D_ann* variable, while hotel quality is denoted by *D*_1&2Stars and *D*_4&5Stars. The comparison of the actual model estimates (Table 5.5) with a model in which the dummy *D_ann* is not included suggests that the capital elasticity does not change, while significant differences emerge in respect to the labor input (to note that the model with the *D_ann* prevails on the model without the *D_ann* dummy and is not rejected by the LR test, LR=175.04; all results are available on request from the authors). Not controlling for annual hotels augments elasticities of family members and managers to 0.23 and 0.21, respectively, thus confirming the accommodation as a labor-intensive sector. This result may be due to several features. The first is related to the measurement of the labor variable used in the analysis, that is, the number of days worked (instead of the usual number of employees) being largely sensitive to the hotel opening. The second issue concerns the different productive opportunities that characterize the seasonal and annual hotels. During seasonal demand peaks, several seasonal hotels in ER face a temporary excess of demand with respect to their available resources, primarily on the summer weekends. For these hotels, the greater benefit (in terms of increases in the value added) is connected to the availability of additional capital rather than labor. When there is a demand surplus, the risk to refuse reservations and customers is mainly due to the lack of rooms and beds. Another feature is related to seasonal workers. Seasonal firms employ nonpermanent staff for whom little training and fewer education programs are organized, thus resulting in a lower

accumulation of knowledge within the firm and in fewer opportunities for efficient labor management (Baum and Szivas, 2008).

The negative effect on productivity of a seasonal hotel is also related to the use of capital. Seasonal enterprises need to finance fixed-asset investments with income flows that are not constant throughout the year. This aspect in a country such as Italy, where interest rates are relatively high, constitutes a considerable constraint on competitive strength as seasonal hotels are generally perceived as more risky (van der Sterren, 2008) and therefore require specialized financial products in which long-term fixed asset investments are combined with flexible, short-term funding to cover seasonal cash flow fluctuations.

As for the hotel rating, the effect on the level of output is negative for the one- and two-star hotels, and positive for the more highly rated hotels. The elevated quality of services and facilities offered by the four- and five-star hotels well meet the needs and preferences of business travelers who have a high propensity to spend money when on vacation.

In the production function, we also control for the localization economies by means of the *D*_ArtMajor and *D*_Tour dummies. Estimates evidence that hotels located in the cities of the arts do not exhibit significant differences with respect to the mean level of output, while operating in a tourism destination allows for better performance.

The picture that emerges implies that there are external economies of scale associated with the increasing quality of the service provided, the annual opening, and the concentration of attractions endowed in a tourism municipality such as mountains, lakes, and thermal localities.

Internal Factors Affecting the Inefficiency of Firms

Not all of the hotels located in ER produce at their maximum level. Several internal factors reduce the efficiency level of hotels. Among these, the most important are annual opening and poor quality (one- and two-star hotels). Seasonal hotels have higher average daily occupancy rates, and they operate with much less uncertainty on the demand side. Therefore, ceteris paribus, they are technically more efficient than annual hotels. To understand the negative result associated with the quality of the service provided, it must be noted the competition of one- and two-star hotels centers on low prices as they offer facilities that were built in the 1960s and have never been structurally renewed. Moreover, these are mainly family hotels that are trying to manage a difficult generational change. The inefficiency associated with four- and five-star hotels may depend on their inability to attract the regional demand, which largely consists of internal mass seaside tourism and is characterized by a relatively low level of purchasing power. As a minor effect, we find that efficiency decreases with both the increase in the proportion of hotel opening days without guests and with the increase in the percentage of revenue due to the intermediation of tour operators and travel agencies.

Conversely, we find that efficiency gains are primarily the result of the "learning by doing" effect (i.e., the older enterprises tend to have lower inefficiency scores

than the younger firms) and in the propensity to (re)invest in the production process a higher part of the turnover (product innovation). The overall results indicate that hotels achieve the greatest return on investment (measured in efficiency gain) when they have a high level of experience and knowledge. A minor but significant positive effect on efficiency is also connected to the percentage of revenues originating from the additional services offered (i.e., wellness, sports, and etc.), thus confirming the importance of diversifying the services offered regardless of the star rating.

Territorial Factors Affecting the Inefficiency of Firms

The causes of seasonality in tourism are usually structural in nature, depending on, among others, supply-side (destination) constraints (Baum and Hagen, 1999). Seasonal destinations are expected to have limited attractiveness or poor connections to resources as they usually display stronger seasonal demand patterns. This destination effect is measured by the variable *Stag*. The positive estimated coefficient proves a strong negative impact on hotel efficiency. A hotel's inefficiency is also significantly dependent on its location, as in the city being popular for art or as a place in a tourism (mainly mountain) municipality. The previous findings suggest that in the ER region, a location in a seaside destination, with a nonmarket seasonal demand pattern, provides hotels with the lowest external losses in operational efficiency. These destinations have the connections, infrastructure, and resources to capture both the leisure segment with the largest market share and the business segment. Business tourism is particularly developed in the region as per capita GDP is among the highest in Italy and many firms are an integral part of global value chains, especially in metal product manufacturing and mechanical and textile sectors. This exposure to international markets partially explains the negative effect on hotel efficiency of the reverse of the firm dimension (FS), as the firm dimension diminishes (i.e., for higher values of firm size [FS]) the hotel inefficiency augments). As expected, the presence of large (internationalized) companies promotes (inbound) business tourism in the municipality where enterprises are agglomerated, and it ensures the greatest possibility of knowledge spillover among different industries. It is also worth noting that the negative coefficient of the variable "Density" excludes (possible) urbanization diseconomies connected to congestion externalities and conflicting preferences among tourists and residents.

Regarding the localization economies, the estimated negative coefficient for the variable *LQ* suggests that operating in a municipality with a specialization (concentration) in hotel activities enhances operative efficiency, thus supporting knowledge spillovers within the industry and a more efficient network for the supply of intermediate goods. Conversely, efficiency is negatively affected by the density of firms (FSR). This is especially true in the leisure sector where the differences between star ratings and the size of hotels located in close proximity to one another are relatively small and price competition is stiff.

Some Insights on Agglomeration Externalities and Efficiency of Hotels

To perform more straightforward comparisons among hotels operating in different municipalities, we compute the efficiency scores from the stochastic frontier model in equation (1) without the (in)efficiency model. The analysis allows us to either confirm previous results or compare how efficiency varies in respect to agglomeration variables used in the analysis.

In general, the kernel density distribution of efficiency scores (Figure 5.1) shows an asymmetric distribution around the mean value (0.72), with a thin tail to the left of the distribution. As the mode is not in the final interval of the distribution, it supports the use of a truncated normal distribution for u_i (Battese and Coelli, 1996). The distribution of technical efficiencies also shows a small number of hotels operating at a low level of technical inefficiency as only 10 percent of hotels show a score lower than 0.56.

With regard to agglomeration effects, the typology of the destination plays a major role in the efficiency distributions. Operating in a seaside destination allows for greater efficiency when compared to other tourism destinations and cities that are art destinations. The seaside municipalities in ER have either invested in the development of infrastructure and services supporting tourism activities or they have diversified their services to include several tourism segments (cultural, artistic, business, and leisure) to achieve better performance.

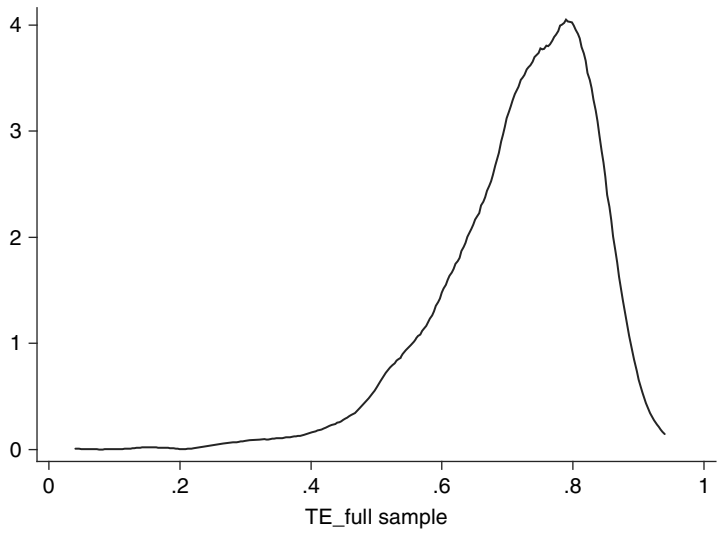

Figure 5.1 Kernel density distributions of technical efficiencies (full sample).

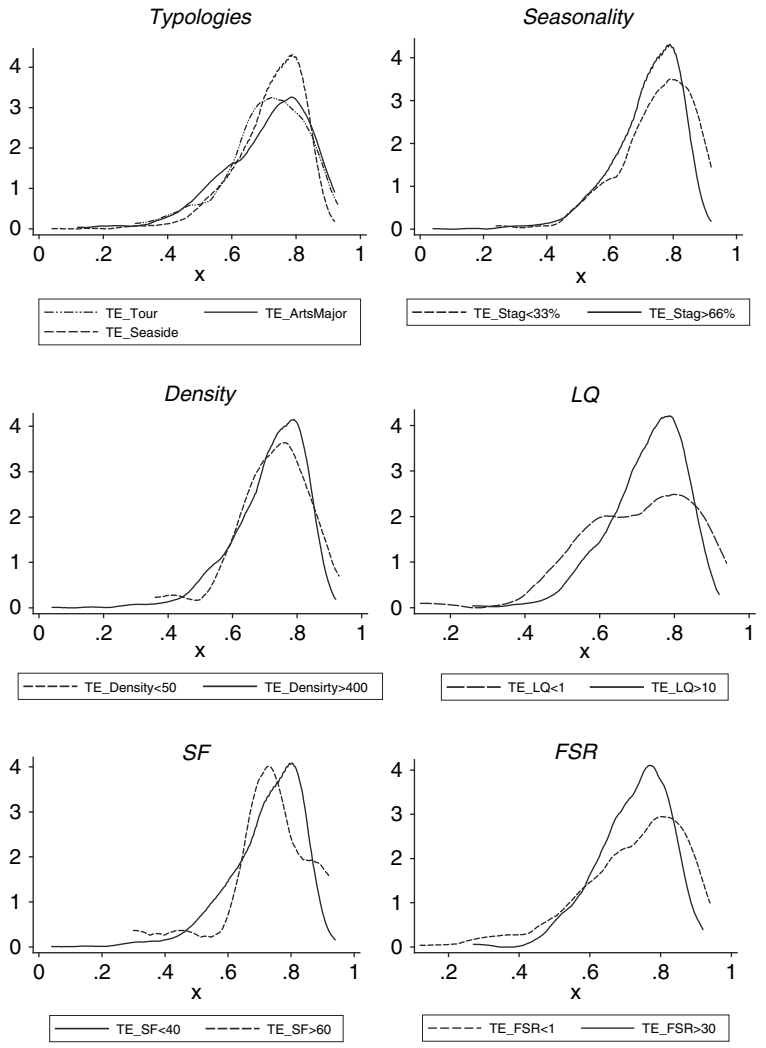

Figure 5.2 Kernel density distributions of technical efficiencies by the main agglomeration variables.

Seasonality of the destination has a mean negative effect on efficiency. If the municipality is mainly a summer destination (more than 66 percent of the tourism production is between June and September), the efficiency distribution is dispersed around low efficiency scores. Conversely, if the destination presents low seasonality (less than 33 percent of the tourism production is in the summer), the hotels demonstrate higher levels of efficiency (the mean efficiency is 0.75).

The effect of urbanization is positive. In other words, as the density of the destination increases, the accommodation sector improves its level of efficiency. In

particular, hotels located in municipalities with more than 400 inhabitants per km^2 exhibit a slight but significant increase in mean efficiency scores (equal to one point) with respect to hotels operating in localities with a density value less than 40.

Localization economies have an important role in influencing hotel efficiency. Operating in localities characterized by an elevated specialization in hotel activities significantly improves the efficiency of the sector. If the LQ is greater than 10 percent, the average efficiency score is approximately 0.73 (for LQ < 1% the mean efficiency score decreases to 0.70).

Conversely, the reverse of the firm dimension (SF) is negatively correlated with efficiency. When a hotel operates close to large (internationalized) companies, its efficiency increases. As evidenced from Figure 5.2, the kernel density distribution of hotels operating in municipalities with high SF (<40), average firm dimension is positioned close to the highest values of efficiency.

Finally, efficiency is negatively affected by the density of firms (FSR). If in the destination there is zero or one hotel per km^2, than the mean efficiency of the accommodation sector is 0.74. Conversely, for more than 30 hotels per km^2, the mean efficiency of the sector decreases to 0.72.

6. Conclusions

Hotels' competitiveness results from either the management practices of internal resources or the competitive advantage given by agglomeration economies. Even if a number of studies have provided evidence that the main factors contributing to hotel efficiency gains are internal to firms (Molina-Azorin et al., 2010), it remains that the production of services in the accommodation industry requires investments in infrastructure and environment that a single firm is usually unable to supply.

We consider a huge sample of hotel firms located in the Emilia-Romagna region to analyze the relevance of localization and urbanization economies in determining firm performance. The focus is twofold as we propose a stochastic frontier approach able to evaluate empirically the performance of a huge sample of hotels heterogeneous in organizational characteristics while simultaneously estimating the role of many territorial characteristics as factors of competitiveness.

The empirical analysis leads to several interesting findings. With respect to production processes, hotels located in ER are characterized by the relevant use of the labor input, confirming that the sector is mainly a labor-intensive industry. The quality of services provided affects the frontier in different ways. The (relative) poor quality has a negative impact on the productivity of one- and two-star hotels, shifting their frontier downward, while the four- and five-star hotel frontier shows a positive shift. Thus, the benefits associated with the upgrading of hotel facilities are particularly important in the current regional context where many low-rated hotels are experiencing a difficult transition between generations of owners. However, the most important internal effect depends on seasonal opening. Annual hotels show positive returns as they have the possibility to fully exploit managerial and employee skills.

Finally, we show the existence of external economies of scale associated with the concentration of infrastructures and attractions in the tourism municipality.

Regarding hotel efficiency, we find that it is significantly affected by both internal firm factors and agglomeration economies. Considering the former, the hotels with the highest efficiency in Emilia Romagna are three-star seasonal hotels that have been in existence for many years. Apart from an important "learning by doing" effect, these businesses have a strong competitive advantage on the demand side, as the seasonal opening helps in achieving high average daily occupancy rates, while their stay on the market allows them to increase the share of loyal customers who book their holidays in advance (mainly long-stay family tourists). Efficiency gains are also related to the propensity to invest (innovate the product) and the offer of a wide variety of ancillary services (i.e., wellness, sports, and so on), thus confirming the importance of product diversification regardless of tourists' spending power.

The analysis also shows the existence of significant agglomeration effects influencing the possibility of hotels located in ER to produce at their maximum level. Inefficiency is related to the tourism product offered by the destination. The best advantages are for accommodation structures located in multiopportunity destinations with resources, infrastructure, and an economic fabric that allows them to host both business tourism and seaside leisure tourism. Hotels in these destinations have a greater chance to reduce uncertainty related to demand seasonality, and they have a greater opportunity for cost- and quality-effective HR management and development. They can also take advantage of the selection of intermediate inputs as professional service providers, requested by business travelers, are co-located with many leisure activity providers. Hotel efficiency is also affected by the presence of large enterprises in the municipality and by the concentration of accommodation activities. Externalities are connected to knowledge spillovers within the industry, a more efficient network for the supply of intermediate goods, and the possibility of attracting (international) high-spending business tourists.

In addition to previous agglomeration economies, this study shows that the number of similar hotels localized in close proximity to one another represents a significant diseconomy as it increases price competition. It is also worth noting that—contrary to what is expected—this study excludes the existence of urbanization diseconomies connected to congestion externalities and conflicting preferences among tourists and residents.

Taking the above results into account, policymakers must work collaboratively with hotel owners to assess (and reduce) the gap between actual performance and the potential frontier production frontier. Debating this theme is particularly important in ER because production structures and regulatory systems are simultaneously changing. The decline of seaside tourism, a generational exchange in hotel ownership, and the strong political impetus toward devolution and federalism are the primary causes for the transformation in the hotel industry.

Destination management can increase firm performance in order to encourage companies to invest in their product innovation. This would benefit the whole tourism destination with respect to both requalification of tourism as a product and an

increase in the employment rate. This latter point is worthy of attention in a region such as ER where the accommodation industry provides a large proportion of jobs.

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