International Journal of Hospitality Management 45 (2015) 59–68

Contents lists available at ScienceDirect

International Journal of Hospitality Management

journal homepage: www.elsevier.com/locate/ijhosman

Modelling growth and revenue for Swedish hotel establishments☆

Martin Falk[a], Eva Hagsten[b,*]

[a] Austrian Institute of Economic Research, WIFO, Austria
[b] Statistics Sweden, Sweden

ARTICLE INFO

JEL classification:
D22
L11

Keywords:
Firm growth
Establishments
Hotel industry
Hotel prices
Urban hotels
Local competition
Sweden

ABSTRACT

This paper provides first estimates of the determinants of output growth of Swedish hotels based on establishment data. Growth of overnight stays is modelled as a function of initial size, age, type of accommodation, location and hotel prices measured as average revenues per guest nights. The empirical model accounts for potential endogeneity of hotel prices through the two-stage least absolute deviation model (2SLAD) and the instrumental variable quantile regression method. 2SLAD estimates show a positive and significant relationship between hotel prices and subsequent growth. The relationship is nonlinear with a decreasing impact as the price level increases. Growth of establishments is significantly higher for smaller and younger hotels. An important result is that city hotels, in comparison to tourist and other hotels – which are mainly located outside urban areas (in the mountains and at the sea) – exhibit significantly higher growth rates with a gap between 2.2 and 3.4 percentage points. Furthermore, the positive impact of hotel prices on growth is larger for high-growth establishments. Accommodation prices significantly decrease with the number of local competitors with a non-linear form and increase with size. City hotels and accommodation in the capital city have the highest revenues per guest night.

1. Introduction

The empirical analysis of firm growth is a classic field in industrial economics. Insights into the determinants of firm growth are particularly interesting for mature markets. A typical example of a mature market is the hotel industry in developed countries, characterised by a high degree of competition and concentration, and declining entry rates (Kalnins, 2006). The industrial economics literature shows that the growth of hotels and other accommodation establishments depends on initial size, age and locational characteristics (Santarelli, 1998; Audretsch et al., 2004; Piergiovanni et al., 2003; Park and Jang, 2010). The tourism literature also shows that age and firm size are central determinants of firm growth in the hospitality industry (see Marco, 2012 for 3600 Spanish hotels and Alonso-Almeida, 2013 for Spanish travel agencies, hotels, and rural accommodations). While age and size are central determinants of long-term firm growth, little is known about the role of the price segment of hotels for growth. It may be the case that growth rates differ systematically between budget, middle class and luxurious hotels. Knowledge of the relationship between prices and firm growth is interesting since it is often stated that high hotel prices signal high quality services.

Studying the growth of overnight stays in hotels in different locations is interesting since city tourism has grown significantly in Europe in recent years whereas tourism in rural areas has stagnated. Driving forces of the increase in tourism to urban areas are supply side factors such as new attractions (e.g., range of sporting events, festivals, and fairs and expositions) (Law, 2002). Other reasons for the rise in urban tourism are the emergence of low cost air carriers with new point to point connections and reduced fares (Page, 2002). Furthermore, in Europe abolition of border controls has facilitated travel to urban destinations. Other reasons for the popularity of urban destinations are changes in leisure preferences towards secondary short leisure trips and increases in travelling for conferences, shopping and cultural tourism (Ashworth and Page, 2011).

This paper contributes to the literature by providing first empirical evidence on the determinants of growth of overnight stays and hotel prices in the Swedish hotel industry at the

☆ The views expressed here are those of the authors. Data for the analysis have been made available through the collaboration within the ESSLAIT project led by Statistics Sweden. We would like to thank the participants of the TCVT3 2014 Conference – DRUID Society Conference 2014, Austrian Economic Association 2014, Annual ICHRIE Summer Conference 2014, 4th International Conference on Tourism Management 2014, 54th ERSA Congress 2014 and 23rd Nordic Symposium in Tourism and Hospitality Conference – for helpful insights and comments. We would also like to thank Hanno Roberts, Jesús Crespo Cuaresma, Juan Carlos Martín, Matthias Firgo, Peter Huber, Agnes Kügler, Anet Weterings, Yang Yang and two anonymous referees for their helpful comments on earlier versions of the paper.

* Corresponding author. Tel.: +46 8 506 942 27.
E-mail address: eva.hagsten@scb.se (E. Hagsten).

http://dx.doi.org/10.1016/j.ijhm.2014.11.009
0278-4319/

establishment level. Special focus is put on the relationship between hotel prices and growth in subsequent years. Growth of establishments is measured as the average annual change in overnight stays (including both domestic and foreign tourists) between two five-year periods. The following samples are employed: one for the pre crises period (2002–2007) and the other for the period 2005–2010. Other determinants of growth include size, age, type of hotel (e.g., city hotel, hostels, cottages) and location. The empirical model accounts for potential endogeneity of output prices through the estimation of the two-stage least absolute deviation model (2SLAD) with the number of competitors in a given municipality as the instrument for prices. In order to allow for heterogeneity of the parameters between low and high growth establishments, we use quantile regression methods. This approach makes it possible to examine the whole distribution of establishment growth through hotels with rising overnight stays, moderate growth of overnight stays and falling growth. Quantile regression has been frequently used in tourism research (Hung et al., 2010; Lew and Ng, 2012; Santos and Vieira, 2012; Chen and Lin, 2013). In order to account for the endogeneity of hotel prices, we employ the control function approach introduced by Lee (2007) with the number of competitors in a given municipality as the instrument for prices.

Sweden is an interesting country case study for the analysis of the growth of hotels. With 29 million overnight stays in hotels and related establishments in 2012, it is a small player in tourism in Europe. However, growth of overnight stays in hotels between 2000 and 2012 is higher in Sweden than those in Mediterranean countries and other Western European destinations.[1]

This paper also contributes to the determinants of prices in the lodging industry. Recent studies show that age, size, location, geographical concentration and share of foreign travellers play a significant role in hotel prices (Hung et al., 2010; Becerra et al., 2013). Unlike most previous studies, we employ the total population of establishments in the lodging industry rather than a selected sample of hotels listed in online booking systems.

The key research questions addressed in this paper are as follows: (i) How important are establishment-specific factors – such as age, size, location, type of accommodation, attractiveness for foreign visitors, region and price segment of the hotels (measured as revenues per visitor nights) – for the growth of visitor nights in establishments? (ii) Are there differences in the determinants between fast and low growing establishments? (iii) What are the main determinants of accommodation prices in the Swedish hotel industry?

The availability of unique establishment data for the total population of the Swedish hotel industry makes it possible to jointly analyse the determinants of growth of establishments and average gross revenues per visitor. The large number of observations makes it possible to model parameter heterogeneity. Data is available for about 2460 establishments for the period 2005–2010 (and 2265 establishments for the period 2002–2007). To the best of our knowledge, this is the first paper to jointly estimate the determinants of growth of visitor nights and hotel prices for accommodation establishments including very small enterprises (the so-called micro enterprises).

The paper is structured as follows: Section 2 describes the theoretical background. Section 3 introduces the empirical model, while Section 4 provides the data and descriptive statistics. Section 5 presents the empirical results, and Section 6 concludes.

[1] Sweden: 2.5 percent, Norway: 1.6 percent, Switzerland: 0.2 percent, Finland: 1.9 percent, Austria: 1.4 percent, Spain: 1.4 percent, Italy: 0.8 percent, France: 0.9 percent per year on average. *Source*: Eurostat, New Cronos.

2. Theoretical background

The analysis of firm growth is a classic field of research in business, management and economic literature. Growth is an important goal of companies because it serves as a basic indication of success. Gibrat (1931) suggests that a firm's growth is independent of its initial size; the probability of output growth should thus be the same for firms of varying sizes in a given industry (see Sutton, 1997 for an overview). However, the majority of empirical studies have shown that firm growth depends significantly negatively on initial size. An important recent study for the US shows that there is no systematic relationship between firm size and growth when controlling for firm age (Haltiwanger et al., 2013). Other factors include age, location and legal form. The literature for tourism establishments also tends to agree that smaller and younger firms grow faster than their larger and older counterparts (Audretsch et al., 2004; Rufin, 2007; Park and Kim, 2010; Park and Jang, 2010).

Location is another important factor for output growth. Barros (2005) suggests that location is a significant determinant of hotel efficiency with hotels in or close to cities being more efficient than those in more remote locations. The reason is that city hotels have the potential to attract more clients and more business tourists. New shopping centres and more new visitor attractions have contributed to this development.

Consequently, city hotels are expected to have better growth prospects than those located in rural areas. Furthermore, urban hotels might have better growth rates because of better flight connections, falling airfare and changes in leisure preferences towards short-term trips.

Besides the classical determinants of firm growth, the price segment can also affect the growth of hotel establishments. Skalpe and Sandvik (2002) suggest that higher prices per unit sold should have a positive effect on firm performance. However, prices depend on a bundle of factors and are likely to be endogenous to firm growth. In the empirical part of the paper we account for endogeneity of hotel prices by using the number of local competitors as the instrument. The number of local competitors can be used as instrument because it is significantly correlated with hotel prices but is not correlated with the error term of the growth equation. The main hypothesis is that prices matters for growth of establishments.

It is well established that in a competitive market, high prices signal high quality products and services, and low prices reflect low products and services (Milgrom and Roberts, 1986; Stiglitz, 1987; Bagwell and Riordan, 1991). Nayyar (1990) suggests that in a competitive market for service products, high prices signal high-quality services. The theoretical foundation for this price quality relationship goes back to Scitovsky (1945) who suggests that consumers associate higher prices with higher quality. For the hotel industry, high average prices reflect the tourist's willingness to pay for high quality hotels. Using data for Taiwanese international tourist hotels, Chiu and Chen (2014) find a significant and positive monotonic function between service quality and hotel prices suggesting that higher prices may signal higher service quality. Similarly, using hotel data for Italy, Abrate et al. (2011) show that hotel prices can be largely explained by quality measured as the star rating category and presence of quality assurance programmes. Anderson (2012) finds that increases in review scores by one point on a five-point scale lead to an increase in prices by 11 percent given level of occupancy or market share. Israeli (2002) and Henley et al. (2004) find a positive relation between hotels' star ratings and hotel prices.

Hotel prices are not only dependent on quality but are determined by an interplay of forces of demand and supply side factors (Gerstner, 1985). A high hotel price may reflect higher costs of provision (room size, labour costs), general high real estate prices and many other hotel attributes such as comfort of bed, atmosphere, bathroom amenities, complimentary items and availability

of recreational facilities like swimming pools and gym facilities (Min et al., 2002).

Numerous studies are available which investigate the determinants of prices of hotels and other accommodation establishments. It is well known that hotel prices vary widely, even within cities (Thrane, 2007). The theoretical background of the price equation is based on the hedonic price model, where prices of a product and/or service are a linear function of its attributes (see Papatheodorou et al., 2012 for a recent survey). Price differences between hotels and other accommodation establishments reflect differences in quality, accommodation specific attributes, location and seasonality. Among accommodation specific factors, size and age are commonly regarded as significant determinants of accommodation prices (e.g., Israeli, 2002; Monty and Skidmore, 2003; Thrane, 2007). Larger hotels often belong to a hotel chain and are typically more luxurious than smaller ones and are thus in position to charge higher hotel rates. For instance, based on a sample of 1490 Spanish hotels in 2005, Becerra et al. (2013) find that room rates increase with size and age. Hung et al. (2010) find a significant and positive relationship between the proportion of foreign travellers and room prices. Another stylised fact is that hotel room rates are higher in city hotels. The reason is that city hotels attract a relatively larger share of business, shopping and cultural tourists who are willing to pay relatively high room rates.

Microeconomic theory suggests that an increase in the degree of market competition leads to lower prices (Shaked and Sutton, 1982). The presence of more firms in the market leads to greater competition and lower profits, and thus drives down prices (Kalnins, 2006). However, this only holds true when products are homogeneous. The seminal empirical study on the relationship between output prices and the size of geographic markets goes back to Bresnahan and Reiss (1991). For retail and professional services, the authors measure the incremental price effects of additional competitors in undifferentiated markets and find that the highest prices arise in markets with one or two firms. Prices are far lower in markets with three or more firms and even lower in markets with more than five firms.

Hotels and other accommodation establishments usually face a high degree of local competition (Kalnins, 2006). Typically, hotels compete with hotels in the same geographic area but not with hotels in other parts of the state or country (McCann and Vroom, 2010; Baum and Mezias, 1992). The relationship between the number of local competitors and average revenues per room or guest is not clearly a priori. A large geographical concentration of hotels may lead to an increase in hotel prices. The reason for that is the reduction of consumer search costs, which increase demand at a particular location (Baum and Haveman, 1997). Another reason is that hotels in urban areas benefit from a shared infrastructure. Therefore, hotel prices might be higher in areas with a large number of competitors due to agglomeration effects. For a given accommodation establishment, competition arises mainly from the same type of hotel but can also occur from other accommodation establishments. Therefore, instead of using the total count of local competitors, which would be an undifferentiated measure, we suggest using a count measure of similar competing hotels/motels in the market (measured as type of hotels). For the hotel industry, the number of local competitors or other market concentration indicators are often used as a measure of competition intensity. This literature also finds that local competition and geographical agglomeration are important determinants of accommodation prices (Baum and Haveman, 1997; Fernandez and Marin, 1998; Becerra et al., 2013; Balaguer and Pernías, 2013; Gan and Hernandez, 2013). Using a sample of 1490 hotels in 67 distinct locations in Spain, Becerra et al. (2013) find that the local number of competitors in the same quality category has a significantly negative impact on room rates. However, geographical distance to the nearest competitor is not significantly different from zero. Balaguer and Pernías (2013) find that the presence of an additional close competitor reduces the level of hotel prices by between 0.8 and 1.9 percent. The literature also shows that hotel prices increase when there are fewer competitors with available rooms (Abrate et al., 2012). Gan and Hernandez (2013) find that the number of nearby competitors has a significant negative impact on hotel prices but not on occupancy rate. The data consists of the numbers for hotels that operated in rural areas across Texas between 2003 and 2005. In contrast, Canina et al. (2005) find greater revenue for hotels located within agglomerations of larger numbers of high-end hotels.

3. Empirical model

The empirical model makes it possible to jointly analyse the determinants of accommodation prices and output growth. Evans (1987) shows that firm growth (G) can be described as the function g in dependence of firm size and age:

$$G = \frac{S_{t'}}{S_t} = g(S_t A_t) \tag{1}$$

here $S_{t'}$ and S_t are the size of a firm in the periods t' and t, respectively, and A is firm age at time t. Adding control variables to the basic firm growth model leads to the following specification:

$$\begin{aligned}\frac{\log(S_{it'}) - \log(S_{it})}{d} &= \alpha_0 + \alpha_1 \log S_{it} + \alpha_2 \log S_{it}^2 + \alpha_3 \log A_{it} \\ &\quad + \alpha_4 \log(\hat{P})_{it} + \alpha_5 \log(\hat{P})_{it}^2 + \alpha_6 \log(S^F/S)_{it} \\ &\quad + \alpha_7 \text{city}_{it} + \sum_{r=1} c_{ir} \text{REG}_{ir} + \varepsilon_{it}. \end{aligned} \tag{2}$$

here $d = t' - t$ stands for the number of years for which visitor nights are measured, so the dependent variable measures the average annual growth rate of overnight stays in a given time period. In this application, t is 2005 and t' is 2010. Alternatively, data for the pre economic and financial crises are used (2002–2007). S_t denotes the size of establishments measured as the number of overnight stays in the initial year. A is initial age of establishment at the beginning of the period measured as a dummy variable for firms between zero and five years old at the beginning of the estimation period. $\hat{P}$ denotes the predicted price obtained from the price equation where average annual revenues per number of guest nights at the beginning of the period are used as an approximation of the hotel price. This measure is very similar to the ADR (average daily room rate) which is commonly used as a measure of the financial performance. We assume that the price growth relationship can be approximated by a quadratic function. S^F/S denotes the initial share of foreign overnight stays and represents a measure of internationalisation. City is a dummy variable measuring whether or the not the hotel is located in an urban area. Finally, REG denotes a set of regional dummy variables with the province of Västra Götaland as the reference category.

As mentioned above, hotel prices are treated as endogenous to firm growth. It is well known that ignoring the potential endogeneity of prices may bias the results of the relationship between prices and subsequent growth. In order to account for the endogeneity of prices, we use instrumental variable methods. In the first stage, average room rates per guests in the initial year are regressed on a number of exogenous variables, including predetermined instruments. Following the literature, hotel prices are modelled as a function of establishment age and size, location, type, population density and geographical concentration:

$$\log(P_{it}) = \beta_0 + \beta_1 \log S_{it} + \beta_2 \log A_{it} + \beta_3 \sum_{i=1}^{n} i_{mt} - 1 + \beta_4 \left(\sum_{i=1}^{n} i_{mt} - 1 \right)^2 + \beta_5 \text{popdensity} + \sum_{r=1} b_{ir} \text{TYPE}_{ir} + \sum_{r=1} c_{ir} \text{REG}_{ir} + \nu_{it}, \quad (3)$$

where m denotes the municipality. The dependent variable P is the annual revenue divided by the number of overnight stays, $P_{it} = Y_{it}/S_{it}$. This measure is free from seasonal effects and measures the actual price that is paid per guest night for each establishment. The control variables are population density (popdensity), type of hotels measured as a set of dummy variables (city hotel, tourist hotel, cottage and hostel where the latter serves as the benchmark category) and regional dummy variables (REG). $\sum_{i=1}^{n} i_{mt} - 1$ denotes the number of competitors within a given municipality m of the same type of accommodation establishment. Alternatively, the number of establishments of all types is used. In order to allow for a non-linear relationship, we included the squared term of the number of local competitors. Alternatively, number of competitors can be measured as a dummy variable which is equal to one for municipalities with 15 or more competitors. The number of local competitors serves as the instrument for prices. Given that the hotel industry belongs to the non-tradable goods sector, the geographical measure comes close to the theoretically appropriate measure of the number of competitors on the product market that is relevant for accommodation establishments.

The first stage price equation can be estimated by OLS. Following the recent literature, the log-linear form is used (Papatheodorou et al., 2012). The firm growth equation is estimated by the two-stage least square estimator (2SLS) and the two-stage least absolute deviation estimator (2SLAD) introduced by Amemiya (1982). This estimator is the analogue to 2SLS in a median regression model consisting of an OLS model in the first stage and the median regression model in the second stage.

The determinants of overnight stays are also estimated by quantile regression techniques. Both OLS and the median regression model provide estimates of the mean effects for the average establishment or at the median value of the conditional distribution of the growth rate. The advantage of quantile regressions is that they provide information about the impact of the independent variable on different points in the conditional distribution of the dependent variable other than the conditional mean (Koenker and Bassett, 1978). Here, we use the quantile regression technique to investigate whether growth-quality differs across the specific percentiles (or quantiles) in the conditional distribution of firm growth. It might be the case that the role of quality of accommodation establishments differs between growing and shrinking establishments.

In the quantile regression framework, the price variable is also allowed to be endogenous. For quantiles other than the median, Lee (2007) introduced the quantile IV estimator using the control function approach. The model consists of two equations:

$$Y = X\alpha(\nu) + Z_1'\gamma(\nu) + U, \qquad X = \mu(\tau) + Z'\varpi(\tau) + V, \quad (4)$$

where Y is firm growth rate and X is hotel prices, which is assumed to be endogenous. Z and Z_1 denote vectors of explanatory variables, U and V are unobserved random variables and μ is an unknown parameter to be estimated. In order to identify the model, it is assumed that at least one variable of Z_1 is significant but not included in Z. Possible endogeneity is accounted for by adding the residual power series of the first stage regions as additional control variables. If the predicted residuals are significant, the instrumented variable – here the price – is endogenous.

The estimation of the determinants of firm growth has to deal with the survivor bias. During the period 2005–2010, 10 percent of the accommodation units disappeared from the sample due to closures or other reasons. In order to account for sample selection in quantile regressions, we use Heckman's sample selection model.

4. Data and descriptive statistics

Data is sourced from the total population of accommodation establishments in Sweden for the period 2005–2010. This contains information on the number of overnight stays for domestic and foreign visitors, number of domestic and foreign arrivals, and revenues on a yearly basis. In addition, the database provides information on the zip code, location (municipality), region (see Fig. A1 in Appendix for a map) and the type of accommodation establishments classified as city hotels, tourist hotels, cottages or hostels. The classification of type of city hotels is based on location. An establishment is defined as a hotel if it has either five rooms or nine beds. The location decides kind of hotel. City hotel are located in urban areas and tourist hotels outside. Leading locations for tourist hotels are ski resorts (for instance Dalarna, Härjedalen and Jämtland), summer destinations along the cost (e.g., islands of Gotland and Öland, Västra Götaland and Halland) as well as destinations close to the large lakes (Vänern, Vättern and Mälaren.) Hostel is a typical low price accommodation and should provide facilities for own catering. Hostels could be located in cities as well as outside and are mainly used by holiday makers. Cottages are also mainly used by holiday makers and should be fully equipped for self-catering and are mostly let on a weekly basis. Included in this category are also private cottages let on same terms but organised through agencies.

The average daily room rate is measured by total revenue divided by the number of guest nights. A municipality denotes the smallest of administrative regions in Sweden. Given the availability of the total population of establishments, we measure the level of competition by the number of accommodation establishments at the municipality level of the same type or of all types. There are 290 municipalities in Sweden and 23 counties. For the sample period 2005–2010, information on 2460 establishments is available and for the pre-crises period 2002–2007, 2254 observations.

Table 1 reports summary statistics for the estimation sample. The descriptive statistics show that the average annual growth rate of overnight stays is 1.5 percent between 2005 and 2010. The number of overnight stays in 2005 is 5463 on average, and revenues per guest night are at about 765 SEK in 2005 (equal to 82 euro given the exchange rate in 2005). The average number of competitors of the same hotel type (city hotel, tourist hotel, cottage and hostel) in a given municipality is 24 and the median is 14. When the number of local competitors is restricted to accommodations of the same type, the number of local competitors decreases to 11 on average and based on the median to four (see Fig. A2 in Appendix for the distribution of the number of local competitors).

As expected, the highest number of establishments can be found in Stockholm with 134 followed by Gotland with 72, and both Göteborg and Åre with 62 each. About 24 percent of the hotels are between zero and five years old at the beginning of the period. Concerning the type of hotel, city and tourist hotels account for the bulk of accommodation establishments with 37 and 31 percent, respectively.

5. Empirical results

As a first step, we check for the possible survivor bias by using the Heckman selection model. The probability of surviving is

Table 1
Descriptive statistics.

	Mean	Standard deviation
Average annual growth of overnight stays 2005–2010	0.0156	0.119
Number of guest nights in 2005	5463	11,825
Revenue per guest nights (SEK) in 2005	765	466
Number of local competitors, all types in 2005	24	30
Number of local competitors, same types in 2005	11	22
Percentage of municipalities with 15 competitors and more of the same hotel type	0.16	
Percentage of young hotels 0–5 years old	0.24	
Type of accommodation		
Hostels and other	0.23	
City hotel	0.37	
Cottages	0.10	
Tourist hotel	0.31	

Provinces	Percentages
Blekinge	0.022
Dalarna	0.070
Gävleborg	0.032
Gotland	0.024
Halland	0.029
Jämtland	0.058
Jönköping	0.040
Kalmar	0.048
Kronoberg	0.023
Norrbotten	0.051
Skåne	0.114
Södermanland	0.027
Stockholm	0.121
Uppsala	0.021
Värmland	0.044
Västerbotten	0.038
Västernorrland	0.031
Västmanland	0.019
Västra Götaland	0.120
Örebro	0.024
Östergötland	0.044

Source: Swedish Agency for Economic and Regional Growth and Statistics Sweden.

modelled as a function of the number of local competitors, market concentration (measured by the Herfindahl–Hirschman index) in terms of revenues, regional dummy variables, and age and size. All variables are measured at the beginning of the period where market concentration and competition indicators are used as identifying variables. Unreported results show that the inverse Mills ratio is not significant at conventional significance levels, indicating that the problem of sample selection is unimportant for the sample of Swedish hotels and other accommodation establishments.

As a next step, we provide OLS estimates of the first stage regression with the logarithm of hotel prices in 2005 as the dependent variable (see Table 2). Three specifications are provided: one with a dummy variable equal to one when the number of local competitors of the same hotel type is 15 or more. The second specification uses the number of competitors of the same hotel type in a given municipality and the specification adds its squared term. Standard errors are adjusted for possible correlation within municipalities in order to avoid the downward bias in estimated standard errors of the local competition variable. The R^2 is 0.71 indicating that more than two thirds of the variation of hotel prices can be explained by the OLS model. The coefficients of the predetermined instruments are significant at the five percent level. In particular, the Wald test shows that the number of local competitors in 2005 and its squared term are jointly significant at the one percent level.

As expected there is a significantly negative relationship between hotel prices and the number of competitors of the same hotel type (see specification ii). The semi-elasticity of revenues per visitor is −0.0019 which translates into an elasticity of −0.01 (given the average number of local competitors of the same hotel type which is about 11). This indicates than an increase in the number of local competitors by 100 percent (from four to eight competitors) leads to an increase in hotel prices by one percent. Notably, however, the magnitude of the relationship is fairly modest. Furthermore, the quadratic term is positive indicating a non-linear relationship between hotel prices and the number of local competitors (see specification iii). Specifically, the negative relationship between hotel prices and the number of local competitors becomes less pronounced when the number of local competitors is increasing (see Fig. A3 in Appendix). When local competition is measured by a dummy variable, we find that hotel prices are 0.1 percent lower when the number of local competitors is 15 or higher. Unreported results show that the results are not sensitive to the definition of the number of competitors, namely, of the same type or all types.

Furthermore, accommodation prices are highest in the capital city, namely, Stockholm, followed by Uppsala. Specifically, prices are 34 percent and 21 percent higher than the reference region of Västra Götaland (calculated by $\exp(\beta) - 1 \times 100$ where β is the coefficient). Accommodation prices are significantly lower in Dalarna which is one of the main winter sport destinations in Sweden and Kalmar (see Fig. A1 in Appendix for a map). Besides the regional dummy variables and number of local competitors, size measured as the number of overnight stays and type of accommodation is significant.

In particular, hotel prices increase with the size of the establishments. Among the different types of accommodations, city and tourist hotels achieve the highest price with a price premium of more than 200 percent as compared to hostels. Urbanisation measured as population density is positively related to hotel prices however the coefficient is only significant at the 10 percent level.

Table 3 shows the two stage least square (2SLS) and the 2SLAD parameter estimates of the determinants of average annual growth of visitor nights between 2005 and 2010 at the establishment level. The lower panel provides results for the 2002–2007 period. The Hansen test of over-identification cannot reject the validity of instruments at the five percent level (based on specification ii). Furthermore, unreported results show that growth of overnight stays is independent on the number of local competitors, indicating the validity of the instruments. In addition, the Durbin-Wu-Hausman chi-sq test shows that the null hypothesis that prices are exogenous is rejected at the one percent level. However, the test is sensitive with respect to inclusion and exclusion of dummy variables in the price equation.

The R^2 values are 0.14 and 0.18 for the 2SLS and the Pseudo R^2 value range between 0.05 and 0.08 for 2SLAD estimates. This is in line with the firm growth literature showing that the determinants of firm growth usually explain only a small proportion of observed growth (Geroski, 2000). The key parameter of interest is annual revenues per overnight stays at the beginning period, which is an indicator of the price level of hotels. Estimates obtained from 2SLS and 2SLAD show that (predicted) hotel prices have a positive and significant impact on the average annual growth of overnight stays between 2005 and 2010. However, the magnitude of the impact of price effect is not large: Hotels with 10 percent higher prices exhibit a 0.13 percentage points higher growth rate of overnight stays between 2005 and 2010. Interestingly, the price effect is almost similar for the pre-crises period (0.015 vs. 0.013). Another interesting result is that the price-growth relationship is non-linear. The higher the hotel price, the lower the link between price and output

Table 2
OLS estimates of the determinants of log revenues per guest nights of accommodation establishments in 2005.

	(i)		(ii)		(iii)	
	Coef.	*t*	Coef.	*t*	Coef.	*t*
15+ local competitors, same category, 2005	−0.12***	−3.88				
# of local competitors, same category, 2005			−0.002***	−4.03	−0.003	−1.46
# of local competitors, same category squared'05					0.0000	0.60
Log number of guest nights	0.03***	5.74	0.03***	5.57	0.03***	5.46
Dummy young firms (0–5 years)	−0.03	−1.65	−0.03	−1.64	−0.03	−1.65
Tourist hotels (benchmark hostels)	1.13***	40.76	1.13***	39.73	1.13***	40.43
City hotel	1.19***	49.70	1.19***	49.59	1.19***	49.82
Cottages	0.04	0.99	0.03	0.94	0.03	0.90
Log population density	0.02*	1.73	0.02*	1.68	0.02*	1.69
Blekinge (ref. category Västra Götaland)	−0.12***	−3.16	−0.11***	−2.93	−0.11***	−2.98
Dalarna	−0.15***	−3.09	−0.13***	−2.85	−0.13***	−2.86
Gävleborg	−0.04	−1.00	−0.03	−0.80	−0.03	−0.84
Gotland	−0.05	−1.59	−0.09***	−3.58	−0.08**	−2.42
Halland	−0.06	−1.59	−0.04	−1.28	−0.04	−1.31
Jämtland	−0.05	−1.03	−0.08	−1.60	−0.07	−1.27
Jönköping	0.04	1.01	0.03	0.86	0.03	0.84
Kalmar	−0.11***	−2.82	−0.10**	−2.47	−0.10**	−2.48
Kronoberg	−0.09	−1.36	−0.08	−1.19	−0.08	−1.21
Norrbotten	0.10	1.61	0.12*	1.78	0.12*	1.79
Skåne	−0.01	−0.22	−0.01	−0.34	−0.01	−0.33
Södermanland	0.07	1.32	0.08	1.45	0.08	1.40
Stockholm	0.27***	7.17	0.29***	7.01	0.28***	6.10
Uppsala	0.18**	2.39	0.19**	2.53	0.19**	2.52
Värmland	−0.08*	−1.72	−0.09*	−1.88	−0.09*	−1.89
Västerbotten	−0.09	−1.46	−0.07	−1.23	−0.07	−1.21
Västernorrland	−0.04	−1.05	−0.03	−0.76	−0.03	−0.76
Västmanland	0.06	0.89	0.07	1.01	0.07	0.97
Örebro	0.01	0.29	0.00	0.04	0.00	0.02
Östergötland	0.01	0.40	0.03	0.74	0.03	0.74
Constant	5.34***	102.56	5.34***	98.91	5.33***	97.23
Adjusted R^2	0.71		0.71		0.71	
# of observations	2463		2463		2463	
Wald test # of local competitors, number of local competitors squared (*p*-value)					0.00	

Standard errors are cluster-adjusted for 282 municipalities for which data is available.
* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

growth. At high hotel prices the elasticity becomes negative indicating that high price hotels do not grow faster than medium prices hotels. For the pre-crises period we also find a nonlinear relationship. Here, the positive impact of prices can be observed over the whole price range.

Furthermore, growth of overnight stays of establishment depends significantly on initial size, age, type of accommodation and location. The sign and significance of the regional dummies are not displayed because overnight stays in both typical summer and winter destinations are highly dependent on favourable weather conditions.

The growth rate of overnight stays is significantly higher for city hotels than that of other types of hotels (tourist hotels, cottages and hostels). This holds true for the pre-crises period and for the more recent sample from 2005 to 2010. Based on 2SLAD estimates the coefficient of city hotels is 0.022 indicating that on average, city hotels have a 2.2 percentage points higher growth rate of overnight stays as compared to other types of hotels. The corresponding coefficient for the pre-crises period is 0.036. The higher growth rate of city hotels is consistent with the worldwide growth of urban tourism, including business tourism (Law, 2002; Maitland and Ritchie, 2009).

The coefficient on initial hotel size is negative and its squared term is positive and significant, indicating a non-linear relationship. This indicates that the negative dependence of the growth rate on initial size decrease in absolute terms as hotel size increases. This leads to a rejection of Gibrat's law. The average effect of initial hotel size is −0.05 calculated as the median of overnight stays. This means that an increase in establishment size by 10 per cent is associated with a fall in the average annual growth rate of overnight stays by 0.5 percentage points. Furthermore, younger establishments have a higher average growth rate of about 1.2 percentage points per year. The findings that younger and smaller hotels grow faster than their larger and older counterparts are consistent with the tourism literature (Alonso-Almeida, 2013; Marco, 2012; Park and Jang, 2010; Rufın, 2007). However, it should be noted that small firms have higher exit rates so the share of small hotels in total overnight stays is not necessarily growing over time.

Table 4 contains the coefficients of the growth equation estimated by the quantile instrumental variable estimator based on the control function approach for two different percentiles (25th–75th percentile).[2] The table also contains the 95% confidence. The results shows that the price variable increases in magnitude and significance when moving from the lower to the higher quantile. In particular, the hotel price variable is positive and statistically significant for the 0.75 percentile but insignificant for the 0.25 percentile. This indicates that the position in the price segment is only relevant for accommodation establishments with higher than average

[2] The Stata module CQIV with the uncensored option developed by Chernozhukov et al. (2012) is used to estimate the quantile IV model.

Table 3
Determinants of growth of overnight stays at the establishment level between 2005 and 2010.

	2SLS		2SLAD		2SLAD	
	Coef.	*t*	Coef.	*t*	Coef.	*t*
Dep var. average annual growth of overnight stays 2005–2010						
Log overnight stays 2005	−0.154***	−7.12	−0.095***	−5.33	−0.096***	−4.87
Log overnight stays 2005 squared	0.009***	6.58	0.005***	4.90	0.005***	4.59
Young firms (0–5 years)	0.023***	3.69	0.012***	2.75	0.014***	2.96
Pred. log revenues per guest nights'05	0.014***	2.91	0.013***	3.33	0.220*	1.73
Pred. log rev./nights'05 squared					−0.017	−1.64
City hotels	0.034***	5.71	0.021***	4.59	0.024***	5.28
Regional dummies	Yes		Yes		Yes	
Constant	0.562***	6.43	0.332***	4.53	−0.296	−0.75
Wald test price, prices squared *p*-value					0.000	
Centred R^2/Pseudo R^2	0.140		0.054		0.054	
Number of observations	2463		2463		2463	
Hansen *J* stat (*p*-value)	0.15					
Dep var. average annual growth of overnight stays 2002–2007						
Log overnight stays 2002	−0.209***	−9.25	−0.114***	−5.38	−0.114***	−5.92
Log overnight stays 2002 squared	0.012***	8.63	0.006***	5.01	0.006***	5.55
Young firms (0–5 years)	0.040***	4.95	0.025***	3.49	0.025***	3.46
Pred. log revenues per guest night'02	0.018***	3.83	0.015***	3.33	0.056	0.40
Pred. log rev./nights'05 squared					−0.003	−0.29
City hotels	0.043***	7.86	0.036***	8.06	0.036***	6.92
Regional dummies	Yes		Yes		Yes	
Constant	0.893***	9.84	0.534***	5.91	0.407	0.94
Wald test price, prices squared *p*-value						
Centred R^2/Pseudo R^2	0.280		0.089		0.089	
Number of observations	2254		2254		2254	
Hansen *J* stat (*p*-value)	0.26					

Note: 2SLAD estimates are based on bootstrapped standard with 200 replications. The first stage price regression is based on specification (iii) displayed in Table 2.
* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

Table 4
Quantile instrumental variable estimates of the determinants of growth of overnight stays at the establishment level between 2005 and 2010 as well as 2002 and 2007.

		2005–2010 Percentile		2002–2007 Percentile	
		0.25	0.75	0.25	0.75
Log initial overnight stays	Coef.	−0.029	−0.168	−0.063	−0.237
	Lower	−0.081	−0.197	−0.149	−0.314
	Upper	0.041	−0.080	−0.023	−0.175
Log initial overnight stays squared	Coef.	0.002	0.009	0.004	0.013
	Lower	−0.002	0.004	0.001	0.009
	Upper	0.005	0.011	0.009	0.018
Young establishments	Coef.	0.018	0.020	0.018	0.036
	Lower	0.002	0.000	0.006	0.008
	Upper	0.033	0.035	0.041	0.069
Pred. Initial log revenues per night stays	Coef.	0.006	0.018	0.010	0.017
	Lower	−0.011	0.005	−0.005	0.001
	Upper	0.020	0.030	0.024	0.033
City hotels	Coef.	0.032	0.023	0.047	0.031
	Lower	0.013	0.001	0.037	0.013
	Upper	0.048	0.036	0.069	0.041
Constant	Coef.	0.026	0.668	0.290	1.109
	Lower	−0.245	0.317	0.050	0.836
	Upper	0.244	0.800	0.675	1.451
Predicted residuals of the first stage regression	Coef.	0.013	−0.009	0.020	0.003
	Lower	−0.017	−0.029	0.001	−0.023
	Upper	0.024	0.007	0.053	0.031

Notes: Quantile IV estimates are calculated using the uncensored option in the CQIV Stata command using a parametric version of the estimator proposed by Lee (2007) and OLS estimates in the first stage. Standard errors are bootstrapped with 200 replications.

growth rates. Furthermore, we find that hotels located in cities have a significantly higher growth rate of visitor nights as compared to other hotels in each of the quantiles. Young hotels grow significantly faster with slightly larger effects in the higher percentiles. However, the predicted residuals of the first stage regression are only significant in one out of four cases indicating that prices are not endogenous in three out of four cases.

6. Conclusions

In this study we investigated the determinants of growth of overnight stays in the Swedish accommodation industry using establishment data. Special emphasis was put on the link between hotel prices and output growth where prices are assumed to be endogenous. Empirical results based on the two stage least absolute deviation estimator showed that the growth rate of overnight stays is significantly positively related with the price segment of the hotels at the beginning of the sample period. However, at high prices the relationship becomes negative indicating that high-end hotels do not have better growth prospects than that of medium price segments. Specifically, ceteris paribus a hotel with 10 percent higher prices can achieve a 0.12 percentage points higher growth rate of overnight stays in the next five years, on average. Using quantile IV estimates, we found that the impact of hotel prices on growth increases when moving the 0.25 percentile to the 0.75 quantile. In addition, city hotels show a significantly higher growth rate of overnight stays as compared with other types of accommodation establishments, which is consistent with the worldwide rise of urban and business tourism. Furthermore, as expected, growth of accommodation establishments is higher for younger and smaller firms. Evidence based on the first stage price regression estimated by OLS showed that hotel prices decrease with the number of competitors of the same hotel type in a given municipality. In addition prices are significantly higher for hotels located in the capital city and generally increase with the size of the hotels.

A potential limitation of the study is that a number of growth drivers could have not been considered because of data availability. It is well know that firm growth depends on the bundle of factors. Specifically, technological and organisational innovations are important drivers of hotel growth (Orfila-Sintes et al., 2005; Hjalager, 2010; Nicolau and Santa-María, 2013). However, for smaller hotels, information on technology use is not available based on official data.

The findings have several practical implications. Although there is a negative relationship between hotel prices and the number of local competitors, the magnitude of the relationship is quite modest. Therefore, investors planning new hotel projects should not be too concerned with the number of competitors in the area. Second, the results of a positive relationship between prices and subsequent growth show that high prices are not generally a burden for growth given location, size, age and other characteristics. However, results for the period 2005–2010 show that growth rates of budget hotels and hotels in the middle price segment have been higher than those of upscale and luxury hotels indicating that the latter suffered more from the economic crises than the lower priced hotels. The low performance of upscale hotels during phases of low economic growth should be a concern for stakeholders. Third, the finding that city hotels have a much better growth perspective than tourist hotels and cottages should be carefully considered by investors when planning new hotel projects. It can be expected that the trend towards city hotels will continue in the next decade. It is important to note that city hotels are not only located in the capital city and other large cities but also in smaller cities.

There are several avenues for future research. One idea is to model the relationship between hotel prices and exit of hotels. It is likely that hotels in the lower price segment have a higher failure risk than upscale hotels. Another idea is to account for spatial dependence in the price and firm growth equation. It is likely that prices and the output growth of accommodation establishments are influenced by the pricing decision and performance of the neighbouring accommodation. The data set makes it possible to identify hotels in neighbouring postal codes. Another idea is to control for chain affiliation. It is likely that the growth prospects of hotels belonging to a chain are better than independent ones. Finally, it is interesting to investigate the role of hotel characteristics and co-location for the subgroup of city hotels which consists of the most dynamic subgroup of accommodation establishments.

Appendix.

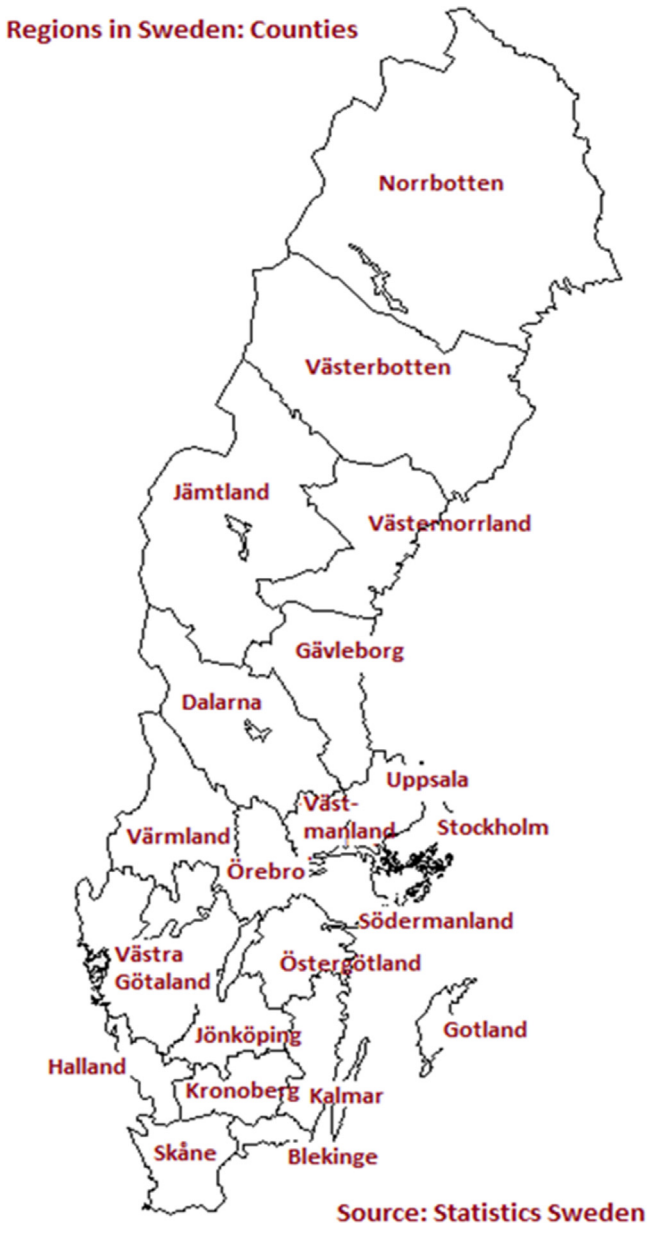

Fig. A1. Map of Sweden.

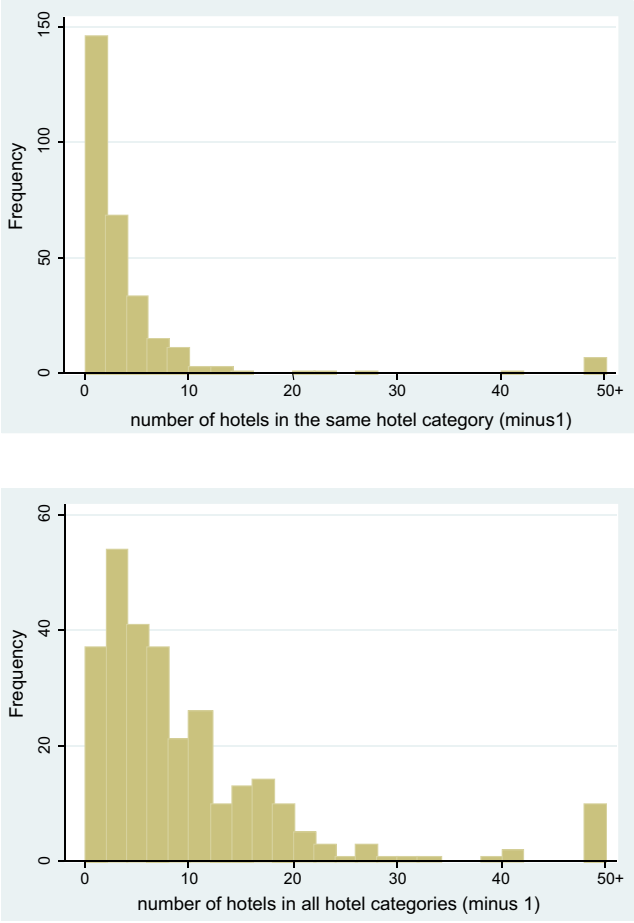

Fig. A2. Distribution of the number of hotel competitors across municipalities.

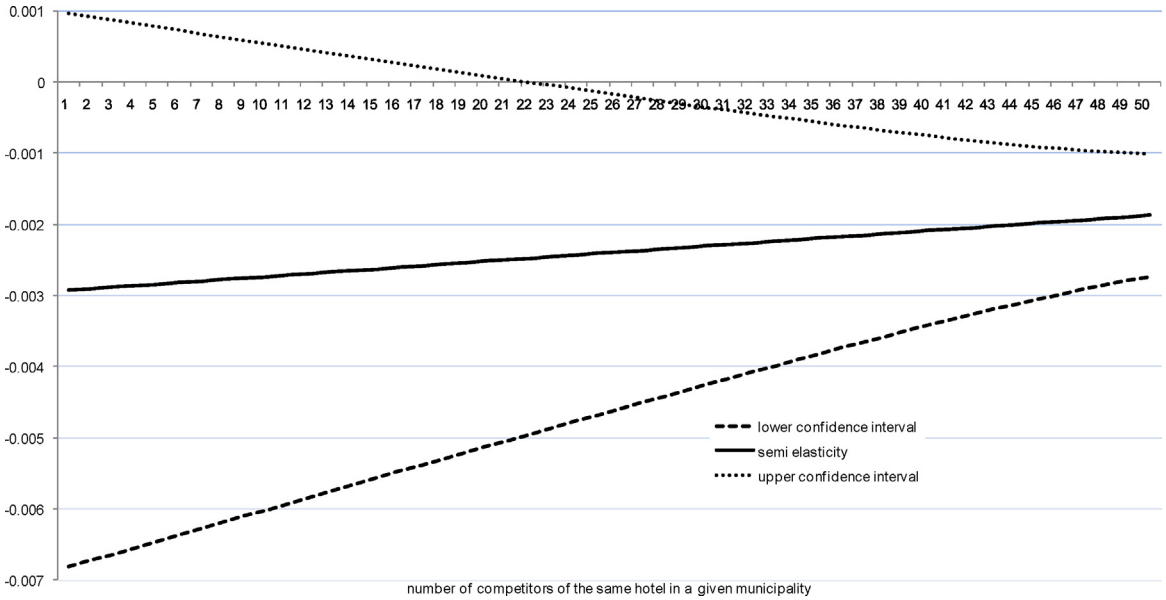

Fig. A3. Semi elasticity of hotel prices with respect to number of competitors of the same hotel. *Notes*: The elasticity of hotel prices with respect to the number of coefficient is calculated based on specification i in Table 1.

References

Abrate, G., Capriello, A., Fraquelli, G., 2011. When quality signals talk: evidence from the Turin hotel industry. Tour. Manag. 32 (4), 912–921.

Abrate, G., Fraquelli, G., Viglia, G., 2012. Dynamic pricing strategies: evidence from European hotels. IJHM 31, 160–168.

Alonso-Almeida, M.D.M., 2013. Influence of gender and financing on tourist company growth. J. Bus. Res. 66 (5), 621–631.

Amemiya, T., 1982. Two stage least absolute deviations estimators. Econometrica 50 (3), 689–711.
Anderson, C.K., 2012. The impact of social media on lodging performance. Cornell Hosp. Rep. 12 (15), 4–11.
Ashworth, G., Page, S.J., 2011. Urban tourism research: recent progress and current paradoxes. Tour. Manag. 32 (1), 1–15.
Audretsch, D.B., Klomp, L., Santarelli, E., Thurik, A.R., 2004. Gibrat's law: are the services different? Rev. Ind. Organ. 24 (3), 301–324.
Bagwell, K., Riordan, M.H., 1991. High and declining prices signal a high-quality product. Am. Econ. Rev. 81 (1), 224–239.
Balaguer, J., Pernías, J.C., 2013. Relationship between spatial agglomeration and hotel prices. Evidence from business and tourism consumers. Tour. Manag. 36, 391–400.
Barros, C.P., 2005. Measuring efficiency in the hotel sector. Ann. Tour. Res. 32 (2), 456–477.
Baum, J.A.C., Mezias, S.J., 1992. Localized competition and organizational failure in the Manhattan hotel industry, 1898–1990. Adm. Sci. Q. 37 (4), 580–604.
Baum, J.A.C., Haveman, H.A., 1997. Love Thy Neighbor? Differentiation and Agglomeration in the Manhattan Hotel Industry, 1898–1990. Adm. Sci. Q. 42 (2), 304–338.
Becerra, M., Santaló, J., Silva, R., 2013. Being better vs. being different: differentiation, competition, and pricing strategies in the Spanish hotel industry. Tour. Manag. 34, 71–79.
Bresnahan, T.F., Reiss, P.C., 1991. Entry and competition in concentrated markets. J. Polit. Econ. 99 (5), 977–1009.
Canina, L., Enz, C., Harrison, J., 2005. Agglomeration effects and strategic orientations; evidence from the U.S. Lodging Industry. Acad. Manag. J. 48 (4), 565–581.
Chen, C.M., Lin, Y.C., 2013. The influence of uncertain demand on hotel capacity. IJHM 34, 462–465.
Chernozhukov, V., Fernandez-Val, I., Han, S., Kowalski, A., 2012. CQIV: stata module to perform censored quantile instrumental variables regression. In: Statistical Software Components.
Chiu, H.H., Chen, C.M., 2014. Advertising, price and hotel service quality: a signalling perspective. Tour. Econ., http://dx.doi.org/10.5367/te.2013.0324 (forthcoming).
Evans, D.S., 1987. The relationship between firm growth, size, and age: estimates for 100 manufacturing industries. J. Ind. Econ. 35 (4), 567–581.
Fernandez, N., Marin, P.L., 1998. Market power and multimarket contact: some evidence from the Spanish Hotel Industry. J. Ind. Econ. 46 (3), 301–315.
Gan, L., Hernandez, M.A., 2013. Making friends with your neighbors? Agglomeration and tacit collusion in the lodging industry. Rev. Econ. Stat. 95 (3), 1002–1017.
Geroski, P.A., 2000. The growth of firms in theory and practice. In: Foss, N., Mahnke, V. (Eds.), Competence, Governance, and Entrepreneurship. Oxford University Press, Oxford, England, pp. 168–186.
Gerstner, E., 1985. Do higher prices signal higher quality? J. Market. Res. 22 (2), 209–215.
Gibrat, R., 1931. Les Inégalités Économiques. Librairie du Recueil Sirey, Paris.
Haltiwanger, J., Jarmin, R.S., Miranda, J., 2013. Who creates jobs? Small versus large versus young. Rev. Econ. Stat. 95 (2), 347–361.
Henley Jr., J.A., Cotter, M.J., Herrington, J.D., 2004. Quality and pricing in the hotel industry: the Mobil star and hotel pricing behavior. Int. J. Hosp. Tour. Adm. 5 (4), 53–65.
Hjalager, A.M., 2010. A review of innovation research in tourism. Tour. Manag. 31 (1), 1–12.
Hung, W.T., Shang, J.K., Wang, F.C., 2010. Pricing determinants in the hotel industry: quantile regression analysis. IJHM 29 (3), 378–384.
Israeli, A.A., 2002. Star rating and corporate affiliation: their influence on room price and performance of hotels in Israel. IJHM 21 (4), 405–424.
Kalnins, A., 2006. The U.S. lodging industry. J. Econ. Perspect. 20 (4), 203–218.
Koenker, R., Bassett, G., 1978. Regression quantiles. Econometrica 46 (1), 33–50.
Law, C., 2002. Urban Tourism: The Visitor Economy and the Growth of Large Cities, CengageBrain.com.
Lee, S., 2007. Endogeneity in quantile regression models: a control function approach. J. Econometr. 141 (2), 1131–1158.
Lew, A.A., Ng, P.T., 2012. Using quantile regression to understand visitor spending. J. Travel Res. 51 (3), 278–288.
Maitland, R., Ritchie, B.W. (Eds.), 2009. City Tourism: National Capital Perspectives. Cabi.
Marco, R., 2012. Gender and economic performance: evidence from the Spanish hotel industry. IJHM 31 (3), 981–989.
McCann, B.T., Vroom, G., 2010. Pricing response to entry and agglomeration effects. Strateg. Manag. J. 31 (3), 284–305.
Milgrom, P., Roberts, J., 1986. Price and advertising signals of product quality. J. Polit. Econ. 94, 796–821.
Min, H., Min, H., Chung, K., 2002. Dynamic benchmarking of hotel service quality. J. Serv. Market. 16 (4), 302–321.
Monty, B., Skidmore, M., 2003. Hedonic pricing and willingness to pay for bed and breakfast amenities in Southeast Wisconsin. J. Travel Res. 42 (2), 195–199.
Nayyar, P.R., 1990. Information asymmetries: a source of competitive advantage for diversified service firms. Strateg. Manag. J. 11 (7), 513–519.
Nicolau, J.L., Santa-María, M.J., 2013. The effect of innovation on hotel market value. IJHM 32, 71–79.
Orfila-Sintes, F., Crespí-Cladera, R., Martínez-Ros, E., 2005. Innovation activity in the hotel industry: evidence from Balearic Islands. Tour. Manag. 26 (6), 851–865.
Page, S., 2002. Urban tourism: evaluating tourists' experience of urban places. In: Ryan, C. (Ed.), The Tourist Experience. Continuum, London, pp. 112–136.
Papatheodorou, A., Lei, Z., Apostolakis, A., 2012. Hedonic price analysis. In: Handbook of Research Methods in Tourism: Quantitative and Qualitative Approaches., pp. 170–182.
Park, K., Kim, J., 2010. The firm growth pattern in the restaurant industry: does Gibrat's law hold? Int. J. Tour. Sci. 10 (3), 49–63.
Park, K., Jang, S.S., 2010. Firm growth patterns: examining the associations with firm size and internationalization. IJHM 29 (3), 368–377.
Piergiovanni, R., Santarelli, E., Klomp, L., Thurik, A.R., 2003. Gibrat's Law and the firm size/firm growth relationship in Italian small scale services. Revue D'Économie industriele 102 (1), 69–82.
Rufın, R., 2007. Sales growth of Spanish tourist firms: some implications of Gibrat's law on marketing management. Tour. Manag. 28 (3), 788–805.
Santarelli, E., 1998. Start-up size and post-entry performance: the case of tourism services in Italy. Appl. Econ. 30 (29), 157–163.
Santos, C., Vieira, J.A.C., 2012. An analysis of visitors' expenditures in a tourist destination: OLS, quantile regression and instrumental variable estimators. Tour. Econ. 18 (3), 555–576.
Scitovsky, T., 1945. Some consequences of the habit of judging quality by price. The Review of Economic Studies 12, 100–105.
Shaked, A., Sutton, J., 1982. Relaxing price competition through product differentiation. Rev. Econ. Stud. 49 (1), 3–13.
Skalpe, O., Sandvik, K., 2002. The economics of quality in the hotel business. Tour. Econ. 8 (4), 361–376.
Stiglitz, J.E., 1987. The causes and consequences of the dependence of quality on price. J. Econ. Lit. 25 (1), 1–48.
Sutton, J., 1997. Gibrat's legacy. J. Econ. Lit. 35 (1), 40–59.
Thrane, C., 2007. Examining the determinants of room rates for hotels in capital cities: the Oslo experience. J. Revenue Pricing Manag. 5 (4), 315–323.