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The Case of Camping Sites

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Price and Quality Competition in Spatial Markets: The Case of Camping Sites*

Dieter Pennerstorfer†

February 28, 2014

Abstract

This paper investigates the influence of competition on price and product quality among Austrian camping sites, a market charactized by both horizontal (spatial) and vertical product differentiation. Theoretically, the effect of competition on quality is ambiguous and depends on the degree of cost substitutability between output and quality. Estimating a system of equations shows that intense competition has a positve impact on product quality and a negative effect on prices (conditional on quality). As high quality is associated with high prices, the total effect of competition on prices is quite small.

Keywords: Spatial competition, price and quality competition, retail markets, camping sites

JEL code: D22, L13, L81, R32

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1 Introduction

This paper investigates the impact of the intensity of competition on prices and product quality in a spatially differentiated market. While many retail markets are characterized by both horizontal (spatial) and vertical product differentiation theoretical and empirical articles investigating both choice variables simultaneously are quite scarce. This might be explained by the difficulty to measure product quality, which can sometimes only be assessed during or after the consumption of the product (experience good). This is not only a problem of economists analyzing certain markets, but also for consumers who have to base their buying decision on a posted price and on an (at least to some extent) unknown product quality. We know from Akerlof (1970) that with this information asymmetry between buyers and sellers in place, there might be a market for the worst quality products only. To reduce uncertainty and to establish a market for high quality goods there are numerous (independent) organizations assessing product quality in certain markets and publishing their results in respective guides. This includes markets for diverse products such as cars, wine, food in general, restaurants, hotels, or – as analyzed in this article – camping sites.

To the best of my knowledge, only four theoretical contributions exist that investigate the effect of competition on both price and quality in a spatial setting. In these models rivaling firms are located on a Hotelling (1929)-style linear market (Ma and Burgess, 1993), or on a circular market (Economides, 1993; Gravelle, 1999; Brekke et al., 2010), as proposed by Salop (1979). The results derived in these models differ: Ma and Burgess (1993) and Gravelle (1999) find no influence of competition on product quality, while the impact in Economides (1993) is negative. All models, however, predict lower equilibrium prices when competition increases. While these models use very specific cost functions Brekke et al. (2010) present a more general theoretical model. Due to the general nature of their model they are unable to make clear predictions on the impact of competition on both price and product quality, but they identify conditions under which competition can reduce prices and enhance product quality. Contrary to the other theoretical contributions Brekke et al. (2010) conclude 'that the scope for spatial competition to stimulate quality provision is larger than previously thought' (p. 478).

Empirical articles investigating the relationship between quality and prices usually estimate a reduced form price equation while treating quality as an explanatory variable.[1] Empirical articles on quality competition are less numerous. Most of those articles analyze

[1]The empirical literature using this approach is quite comprehensive and includes studies on diverse markets such as (for example) wine (Combris et al., 1997; Benfratelloa et al., 2009; Roma et al., 2013; Huber et al., 2013), hotels (Andersson, 2010), restaurants (Fogarty, 2012; De Silva et al., 2013) or hospitals (Mobley, 2003; Mobley et al., 2009).

the health care market, where prices are typically regulated. Gaynor (2004) and Gaynor (2006) provide a comprehensive survey of empirical contributions on this industry and conclude that most studies (based on US data) of Medicare (i.e. insured) patients find a positive impact of competition on quality.[2] Empirical evidence on other industries is quite scarce: Mazzeo (2002), for example, finds that competition reduces delays (and therefore enhances quality) in the airline industry, but he leaves the firms' pricing decisions out in his analysis.

To the best of my knowledge there are only a few empirical articles that consider both quality and prices as strategic variables when analyzing the impact of the intensity of competition. In one of those, Domberger et al. (1995) investigate competitively tendered contracts for cleaning services. They distinguish between quality aspects specified in the contracts (ex-ante quality) and the quality observed ex-post (share of sites that received a 'pass' by an inspection). The authors show that ex-ante quality affects both prices and ex-post quality, whereas prices influence ex-post quality but not vice versa. In this triangular equation system Domberger et al. (1995) show that competition reduces prices and maintains or even enhances ex-post quality. Emmons and Prager (1997) investigate the impact of competition in the US cable television industry on prices and quality (measured by the number of channels) in local markets. They estimate reduced-form price and quality equations and do not estimate interaction effects between these two variables. They find that tougher competition reduces prices while leaving quality unaffected. Gravelle et al. (2013) investigate spatial price and quality competition among general practitioners in Australia. They find evidence that more competition (lower distance to rivaling general practitioners) reduces average prices, but its impact on quality (average consultation time) is small (albeit positive) and not statistically different from zero. Similar to Emmons and Prager (1997) Gravelle et al. (2013) estimate reduced-form price and quality equations only.

Reviewing the theoretical literature suggests that the effect of competition on product quality is closely related to firms' costs of providing high quality products. To stress this relationship I propose a simplified version of the spatial competition model described in Brekke et al. (2010) that allows me to pin down the relationship between firms' cost structure and their choice of prices and product quality. Three main findings are worth mentioning: First, tougher competition enhances product quality if and only if the degree of production cost substitutability of quantity and quality is large enough (i.e. higher than consumers' marginal utility of quality). Second, if cost substitutability is high enough such that competition increases quality, then product quality is associated with higher prices. Third, conditional on product quality more competition reduces prices, while the unconditional effect is ambiguous.

[2]The positive impact of competition on quality of the majority of empirical articles is in line with theoretical models of spatial quality competition with fixed (regulated) prices, see, e.g., Nuscheler (2002), Montefiori (2005) or Brekke et al. (2006).

These predictions are tested empirically for the market for camping sites. Generally, tourists' accommodation choice can be explained by models of spatial (horizontal) product differentiation as long as tourists pick their destination first, and choose an accommodation in the respective local market. Horizontal product differentiation can be associated with physical travel costs when switching from one supplier (accommodation) to another or with the disutility when choosing a variety in the product space that is less than ideal. The market for camping sites is a particularly well-suited retail market as it fits well to the assumptions of the theoretical model proposed in this article: (i) Each firm can choose prices and quality levels, (ii) spatial product differentiation as well as product quality are important,[3] and (iii) the market is characterized by independent retailers rather than retail chains controlling large numbers of outlets.

This article contributes to the scarce empirical literature on spatial markets when both price and quality are strategic variables: To the best of my knowledge this is the first empirical attempt to estimate the effect of competition (measured by the number of or the distance to rivals in local markets) on prices and product quality in a system of equations, treating product quality as an endogenous variable in the price equation. The nationality of tourists is used to identify product quality in the empirical specification, assuming that the (marginal) valuation of quality differs between consumers across countries. Estimating a system of equations is preferred over a reduced form model because this approach provides evidence on the strength of the interaction between the two choice variables (price and quality) and because the theoretical model proposed in this article predicts a price dampening effect of competition conditional on product quality, while the unconditional effect remains ambiguous.

The remainder of the article is organized as follows: The next section 2 sets up the model and derives testable hypotheses of the effect of competition on (equilibrium) price and quality. Section 3 provides information on the industry and describes the data sources used in the empirical analysis. Besides, this section describes the measures of price and product quality and discusses controlling for (endogenous) location choice of firms and identifying the system of equations. The results and the sensitivity analysis are presented in sections 4 and 5. The concluding section 6 discusses the results, policy conclusions and directions for future research.

[3] In a survey in conducted in Croatia in 2008 nearly 1,300 camping tourists were asked why they chose that particular camping site. 36.7% and 35.8% of the respondents reported that the 'general quality of the campsite' and the 'quality of the sanitary facilities' were important, whereas only 16.5% answered that the price was essential (Gržinić et al., 2010).

2 Model

2.1 Model Setup

Following Salop (1979) the spatial market is described as a circle with circumference equal to 1. n independent firms are located equidistantly on this circular market. Each firm i offers a product of price p_i and quality q_i. Each consumer buys exactly one unit of the most preferred variety and the consumers are uniformly distributed around the circle with density L. A consumer located at a distance d_i (in the geographical or in the product space) from firm i has to incur linear transportation costs t. The utility of a consumer buying from firm i who is located at a distance d_i from this firm is given by:

$$U_i = v + b(q_i) + u(y) \tag{1}$$

with

$$y = Y - p_i - td_i \tag{2}$$

with Y as gross income. The utility consumers derive from the product can be divided in the net valuation v and in the utility depending on the quality of the product $b(q_i)$, with $b_q > 0$ and $b_{qq} \leq 0$.[4] v is assumed to be large enough that the market is covered in equilibrium. y is a numeraire good and utility is assumed to be (weakly) concave in consumption of this numeraire, i.e. $u_y > 0$ and $u_{yy} \leq 0$.[5] Let firm $i+1$ ($i-1$) be the firm located next to firm i on one (the other) side of the road, and denote the distance between the location of firm i and the consumer who is indifferent from buying at firm i and $i+1$ ($i-1$) with d_{iz+} (d_{iz-}). d_{iz+} is implicitely given by:[6]

$$v + b(q_i) + u\left(Y - p_i - td_{iz+}\right) = v + b(q_{i+1}) + u\left(Y - p_{i+1} - t\left(\frac{1}{n} - d_{iz+}\right)\right) \tag{3}$$

Total demand for firm i adds up to $X_i = L\left(d_{iz-} + d_{iz+}\right)$, with Ld_{iz+} (Ld_{iz-}) being the consumers located between firm i and $i+1$ ($i-1$) that patronize firm i. The demand for firm i can be characterized by $\frac{\partial X_i}{\partial p_i} < 0$, $\frac{\partial X_i}{\partial q_i} > 0$, $\frac{\partial X_i}{\partial p_{i-1}} > 0$, $\frac{\partial X_i}{\partial p_{i+1}} > 0$, $\frac{\partial X_i}{\partial q_{i-1}} < 0$ and $\frac{\partial X_i}{\partial q_{i+1}} < 0$.[7]

[4]Parameters as subscripts denote the respective partial derivatives.

[5]This model is somewhat more restrictive compared to the model presented by Brekke et al. (2010), who model consumers' utility as $U_i = v + b(q_i) - \rho g(d_i) + u(y)$, with $y = Y - p_i - th(d_i)$ and $th(d_i)$ ($\rho g(d_i)$) as monetary (non-monetary) transport costs. Restricting $\rho = 0$ and $h(d_i) = d_i$ is reasonable for the camping industry analyzed in this article and facilitates highlighting the importance of firms' cost structure when analyzing the effect of competition on firms' price and quality choice.

[6]Characterizing d_{iz-} is very similar and is therefore omitted for convenience.

[7]See Appendix A for a formal derivation of this system of equations.

Profits π_i are given by:

$$\pi_i = p_i X_i(.) - C(X_i(.), q_i) \tag{4}$$

Where $C(X_i(.), q_i)$ denotes the production costs with $C_X > 0$, $C_{XX} \geq 0$, $C_q > 0$ and $C_{qq} > 0$. Production costs of quality and quantity can be substitutes ($C_{Xq} > 0$), complements ($C_{Xq} < 0$) or independent ($C_{Xq} = 0$).

Firms are assumed to choose price and quality levels simultaneously. Based on first order conditions and on the assumption of a symmetric equilibrium, equilibrium quantity $X^* = \frac{L}{n}$ and the equilibrium price and quality, p^* and q^*, can be characterized by the following system of equations:[8]

$$p^* = \frac{t}{n} + C_X(\frac{L}{n}, q^*) \tag{5}$$

$$\frac{L}{nu_y\left(Y - p^* - \frac{t}{2n}\right)} b_q(q^*) - C_q(\frac{L}{n}, q^*) = 0 \tag{6}$$

The equilibrium price p^* is directly negatively affected by the intensity of competition (measured by n or the inverse of t) and positively by the marginal costs C_X. Note that marginal costs are fully shifted to consumers (this result has also been derived by Salop (1979) without vertically differentiated products) and that equlibrium prices are not affected by the concavity of the utility of income. Equilibrium product quality depends positively on consumers' (marginal) valuation of quality, b_q (and therefore on a firm's marginal revenue generated by providing a marginal increase in quality, $\frac{L}{nu_y} b_q$), and negatively on both the marginal utility of the numeraire good, u_y, and the marginal production costs of quality, C_q. Note that an increase in the (marginal) valuation of quality, b_q, does not influence prices directly, but only due to a change in C_X coming from a change in q^* (as long as $C_{Xq} \neq 0$), which is again fully shifted to consumers in equilibrium.

2.2 Effect of Competition on Price and Quality

In spatial competition models an increase in the degree of competition can be modeled as a decrease of transportation costs t or as an increase in the number of firms n in a market. Since transportation costs are not expected to vary much within local sub-markets, I focus on the number of firms to measure the intensity of competition. In evaluating the effect of competition on equilibrium prices and quality levels, marginal utility of consuming the

[8] As the equilibrium is symmetric, p^* and q^* are identical for all firms. The subscript i is therefore suppressed for convenience.

numeraire good is assumed to be constant and is normalized to one for convenience (i.e. $u_y = 1$). This assumption is justified (in this sub-section) as prices for staying at camping sites usually account only for a small fraction of consumers' income. Income effects of price changes (induced by a change in the intensity of competition) are expected to be (neglibly) small. Differentiating equation (6) that characterizes q^* with respect to n gives:[9]

$$\frac{L}{n} b_{qq} \frac{\partial q^*}{\partial n} - \frac{L}{n^2} b_q + \frac{L}{n^2} C_{Xq} - C_{qq} \frac{\partial q^*}{\partial n} = 0 \tag{7}$$

rearranging gives:

$$\frac{\partial q^*}{\partial n} = \underbrace{\frac{1}{n\left(\frac{n}{L} C_{qq} - b_{qq}\right)}}_{>0} \underbrace{(C_{Xq} - b_q)}_{\lesseqgtr 0} \tag{8}$$

as $\frac{1}{n\left(\frac{n}{L} C_{qq} - b_{qq}\right)} > 0$ it depends on the term $C_{Xq} - b_q$ whether competition has a positive impact on quality. If cost substitutability between quality and output is sufficiently high (i.e. $C_{Xq} > b_q$) an increase in competition will increase equilibrium quality.[10]

Differentiating equation 5 that characterizes p^* with respect to the number of firms gives:

$$\frac{\partial p^*}{\partial n} = -\frac{t}{n^2} + \frac{\partial C_X}{\partial X^*} \frac{\partial X^*}{\partial n} + \frac{\partial C_X}{\partial q^*} \frac{\partial q^*}{\partial n} = -\underbrace{\frac{t}{n^2}}_{>0} - \underbrace{\frac{L C_{XX}}{n^2}}_{\geq 0} + \underbrace{C_{Xq}}_{\lesseqgtr 0} \underbrace{\frac{\partial q^*}{\partial n}}_{\lesseqgtr 0} \tag{9}$$

The change in equilibrium prices comes from two sources: First, an increase in competition (the number of firms) reduces spatial product differentiation and therefore has a restraining effect on prices. This effect is captured by $-\frac{t}{n^2}$ and can also be derived from the 'classical' Salop (1979)-model for (vertically) homogeneous products. Second, a price change can stem from a change in marginal costs, denoted by C_{XX} and C_{Xq}. An increase in competition will reduce output (by $\frac{L}{n^2}$) leading to a (weak) reduction in marginal production costs (as $C_{XX} \geq 0$), which is fully passed on to the consumers.

An increase in competition might also affect equilibrium quality. If output and quality are cost compliments ($C_{Xq} < 0$) an increase in competition will reduce q^* ($\frac{\partial q^*}{\partial n} < 0$), which in turn increases marginal costs (as $C_{Xq} < 0$) and therefore equilibrium prices by $C_{Xq} \frac{\partial q^*}{\partial n} > 0$. If $0 < C_{Xq} < b_q$, competition has a negative effect on equilibrium quality, but also (at

[9]When calculating comparative statics with respect to the number of firms it is assumed that firms can (and do) reallocate without costs. This, of course, is unrealistic in many retail markets. Another perspective of comparative statics is to compare two local markets that are characterized by different numbers of firms but are otherwise identical.

[10]Note that this result also covers the special cases of Economides (1993) and Gravelle (1999): In Economides (1993) $C_{Xq} = 0$ and therefore $\frac{\partial q^*}{\partial n} < 0$, while Gravelle (1999) assumes firms' costs and consumers' utility of quality such that $C_{Xq}(X, q^*) = b_q = 1$ and therefore $\frac{\partial q^*}{\partial n} = 0$.

least) a dampening effect on p^* ($C_{Xq}\frac{\partial q^*}{n} < 0$). If cost substitutability is sufficiently high ($C_{Xq} > b_q$), more competition leads to a higher q^*, which in turn has an upward impact on p^* ($C_{Xq}\frac{\partial q^*}{\partial n} > 0$). If $C_{Xq} = 0$ (as in Economides (1993)) marginal costs are unaffected by a change in q^*, and if $C_{Xq} = b_q$ (as in Gravelle (1999)) equilibrium quality, q^*, is unaffected by competition. In both cases $C_{Xq}\frac{\partial q^*}{\partial n} = 0$.

2.3 Identification of Product Quality

The system of equations (5) and (6) charactarizing equilibrium prices and quality levels shows that quality influences price (by way of altering marginal production costs, C_X), while quality remains unaffected by prices – except for the effect of equilibrium prices on the marginal utility of the numeraire good, which is expected to be neglibly small given that camping expenditures account only for a small share of consumers' income. This leaves a triangular system of equations to be estimated. There are two ways to identify product quality: First, identification may come from differences in the marginal utility of quality b_q across local markets. Obviously, differences in b_q affect equilibrium quality q^*, while equilibrium prices p^* are only indirectly affected (via a change in marginal production costs C_X due to a change in q^*). Second, identification can stem from differences in gross income, Y, as long as utility of income is strictly concave ($u_{yy} < 0$). In the previous sub-section I assumed constant marginal utility of income, as price differences across camping sites account only for a small fraction of consumers' income and will have neglibly small effects on the marginal utility of income. Contrary, differences between consumers' income Y may be large, leading to substantial differences in the consumer' willingness to pay for high quality across local markets (even if b_q is the same in all sub-markets). This can be illustrated by differentiating (6) with respect to income Y, which – assuming $u_{yy} < 0$ – gives:

$$\frac{\partial q^*}{\partial Y} = \underbrace{\frac{1}{Lb_{qq}u_y - nu_y^2 C_{qq}}}_{<0} \underbrace{Lb_q u_{yy}}_{<0} > 0 \tag{10}$$

while differentiation (5) gives:

$$\frac{\partial p^*}{\partial Y} = \underbrace{C_{Xq}}_{\lesseqgtr 0} \underbrace{\frac{\partial q^*}{\partial Y}}_{>0} \tag{11}$$

Similar to b_q, differences in consumers' income Y affects quality provided by firms directly, while product prices are only indirectly affected. This theoretical finding is supported by empirical evidence provided by Fleischer and Rivlin (2009), who use individual (household) level data to show that an increase in income increases the quality of vacation consumed by households. The empirical part of the present article draws on these results and exploits differences in the (national) composition of tourists between local markets, which will be discussed in section 3, after giving a short description of the Austrian tourism industry, an issue to which we turn now.

3 Industry Background, Data and Empirical Specification

3.1 Camping Sites and other Forms of Accommodations

Tourism is a very important industry in Austria. Within the one-digit industry (NACE) code 'accommodation and food service activities' firms generated sales of more than 7.3 billion Euros in 2011 and employed nearly 270,000 workers. In the summer season 2012 the number of overnight stays aggregates to more than 65 millions. These services are supplied by more than 63,000 accommodation facilities that offer a capacity of more than 1.2 million beds (Statistik Austria, 2013).[11] While more than two third of all facilities are households who privately rent out rooms and holiday homes, they account for less than one fourth of the entire capacity and account for only 9% of all overnight stays. On the other hand, hotels account only for one fifth of all facilities, but comprise nearly one half of the entire capacity and cover nearly two thirds of all nights spent in any accommodation facility. The number of camping sites is only 557 and therefore accounts for less than 1% of all accommodation facilities. However, camping sites are rather large and supply on average a capacity of 340 'beds'[12] and therefore account for more than 15% of the aggregate capacity[13] and comprise more than 7% of all overnight stays (more than 4.6 million stays in in the summer season 2012).[14]

The industry structure of camping sites differs considerably from hotels (especially hotels with four and five stars) and is characterized by independent retailers who usually control one outlet only, which fits well to the assumption of independent firms in the theoretical model. This structure justifies the assumptions that firms' decisions on prices and quality levels are

[11] To put these figures into perspective, Austria has around 8 million inhabitants.

[12] To calculate the number of beds the Austrian statistical office ('Statistik Austria') multiplies the number of pitches on a camping site by four.

[13] The average capacity of hotels is considerably smaller and is strongly correlated with quality: The average capacity of four and five star hotels is more than 100 beds, while the number of beds average only 23 for one and two star hotels.

[14] Other types of accommodation include commercial holiday homes, youth hostels, recreation homes for children, sanatoria, alpine huts and 'other' accommodation facilities, that account for about 10% of all accommodation facilities.

based on local demand and cost conditions and on the intensity of competition within the local market, which might not be the case for other industries that are characterized by large chains that control multiple outlets (which is common in many retail markets, e.g. food retailing or retail gasoline). Unlike many hotels, prices for camping pitches usually do not vary on a day-to-day basis (only between peak season and off-saison) and are non-negotiable. Prices are usually announced during winter for the following spring and summer and are typically not adjusted during the summer season.

3.2 Data and Empirical Specification

Empirical Specification: Based on predictions from the theoretical model presented in section 2 the following triangular system of equations is going to be estimated:

$$p = \varphi_p q + C\delta_p + X\beta_p + \epsilon_p \tag{12}$$

$$q = C\delta_q + X\beta_q + Z\gamma_q + \epsilon_q \tag{13}$$

with p and q as price and quality, C as the measures of competition, Z summarizing the instruments for quality and X comprising all control variables, including site characteristics, dummy variables of the districts, where the sites are located, and variables controlling for endogenous location choice. ϵ_p and ϵ_q are the error terms and φ_p, δ_p, β_p, δ_q, β_q and γ_q are the paramters to be estimated. In the remainder of this section I will describe the data sources utilized in the analysis and the variables used to estimate this system of equations.

Data Sources: The main data source is the German car drivers' association ADAC that provides information on camping sites valid for the years 2010, 2011 and 2012.[15] The data covers an unbalanced panel of 292 Austrian camping sites (859 observations in total) including information on the location of the site (address and coordinates), price and quality of the offered product as well as various site and product characteristics. This sample is supplemented by data on the location of all other camping sites not covered by the ADAC-guide to get a comprehensive sample of all Austrian camping sites. These additional information comes from the webpage 'www.campingfuehrer.at' originating from 2012 and from 'Herold Marketing' (see below), a telephone book containing firm level data such as firms' addresses and industry codes.[16] I also include data on the municipality level, where the campings sites

[15] This information is reported in an anually published guide named 'ADAC Camping und Caravaning Führer Südeuropa' ('ADAC Camping and Caravanning Guide Southern Europe').

[16] The data was cross-checked with comprehensive information on the location of all camping sites from the Austrian statistical office ('Statistik Austria'), that provides information on the number of camping sites at the municipality level. Information on the location of the (few) missing camping sites are acquired by internet research.

are located, as well as information on other tourism activities in the vicinity. Information on population density are provided from the Austrian statistical office ('Statistik Austria') at the municipality level, collected in 2005. Information on other tourism activities in the vicinity (tourist information, hotels, restaurants, etc.) again comes from 'Herold Marketing' from 2008. Data on the number of touristic overnight stays, the nationality of tourists, and on the number and the quality of hotels in the municipality are also provided by Statistik Austria for the summer season 2008. The empirical analysis draws on lagged data on tourism activities outside the camping industry to avoid concerns about endogeneity (see below).[17]

Price: Besides prices on 'single items' like overnight stays for adults and children, fees for a pitch, a tent, a car or a caravan and (fixed or variable) rates on electricity, the ADAC camping guide also offers a so-called 'reference price' that summarizes consumer expenses for a standardized product. This reference price includes the price for a one-night-stay for two adults and a 10 year old child and the stand fee for a car or a caravan (up to 5 meters length), including taxes, expenses for warm showers, electricity and garbage. Expenses paid only once are divided by 7 (as a stay of one week is assumed). The empirical analysis is based on this reference price, as it includes the expenses for a standardized product and is therefore comparable across camping sites. The reference price is unavailable (or reported from a previous year) in about one third of all observations summarized in the ADAC camping guide, leaving 567 price quotes from 241 camping sites.

Product Quality: Product quality is measured by ADAC in two different categories (sanitary accessories and tent/trailer pitches) on a six-stage scale (ranging from zero to five stars) for each category. The evaluation of quality (in each category) combines cardinal data (like the number of showers with respect to the capacity of the site, or the size of the pitch) and binary data (e.g. whether pitches are subdivided and have connections to power supply) with qualitative assessments (e.g. cleanliness). The quality ratings of both categories are aggregated to form a composite quality index, which leaves a single measure of quality ranging from zero to 10. Figure 1 shows the distribution of the measure of product quality used in this analysis and Figure 2 illustrates the average price for each level of quality. Figure 2 indicates that high quality levels are also associated with higher prices.

Intensity of Competition: The data set includes geographical information (addresses as well as coordinates) of all camping sites. Using data from ArcData Austria and the ArcGIS extension WIGeoNetwork enables me to link the geographical location of each camping site to information on the Austrian road system, which allows me to generate accurate measures of distance, measured in driving rather than air-line distance. To construct measures of

[17]Data on population density are from 2005 because information for 2008 is unavailable at the municipality level.

Figure 1: Distribution of Product Quality

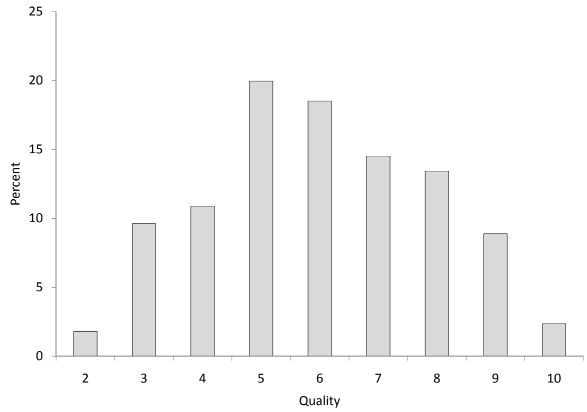
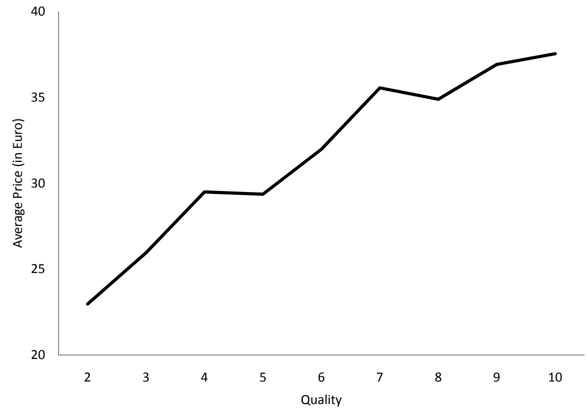


Figure 2: Price and Product Quality



competition I follow related empirical articles that define the intensity of competition by the number of competitors within a particular distance[18] or by the (average) distance to rivals[19] in the vicinity. In particaler, I use the number of rival firms within a distance of two miles and between a distance of two and four miles in one, and (the logarithm of) the average distance to the three closest competitors[20] in another specification. While the number of competitors used to calculate the average distance to rivals is somehow arbitrary, previous findings by Bresnahan and Reiss (1991) for different industries suggest that only a small number of rivals are relevant for the firms' pricing decisions.[21] Note that information on all 557 camping sites is used to calculate these variables measuring the intensity of competition. Figure 3 shows the distribution of the number of rivals within two miles and between two and four miles. Figure 4 illustrates the average price and the average quality level of all camping sites characterized by a particulare number of competitors. This figure shows that more competition is associated with better quality, but also with higher prices.

Identification of Product Quality: The theoreticel model presented in section 2 shows that identification of product quality can come from differences in consumers' (marginal) valuation of quality and from differences in consumers' income across local markets (as long as the assumption of strict concavity of utility in income holds). I use these findings in the

[18]This is a quite common approach and is applied e.g. by Barron et al. (2004), Thomadsen (2005), Lewis (2008), Chandra and Tappata (2011), De Silva et al. (2013) or Pennerstorfer and Weiss (2013).

[19]These concepts are, among others, applied by Thomadsen (2005) or Firgo et al. (2012), who use the distance to the nearest neighbor, and by Gravelle et al. (2013), who use the distance to the third nearest neighbor (in their main specification).

[20]If the distance to the next, second or third next rival is larger than 10 miles the respective distance is set to 10. Given the localized nature of competition in this market any further increase in spatial differentiation is not expected to change the intensity of competition.

[21]Bresnahan and Reiss (1991) find that the (negative) price effect of market entry is large for the second and the third firm in a geographically isolated market, but dries out quickly as the number of competitors increases.

Figure 3: Intensity of Local Competition

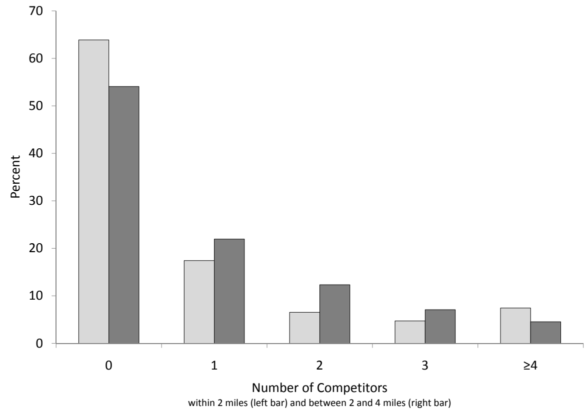
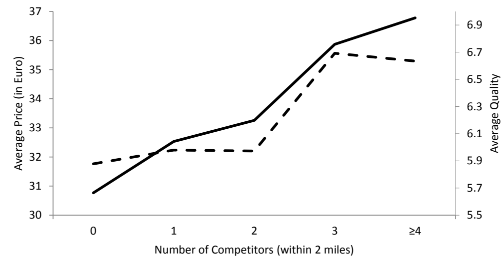


Figure 4: Price and Product Quality by Competition



Notes: The solid line denotes the average price (left axis) and the dotted line the average quality (right axis).

empirical analysis by utilizing information on the country of origin (nationality) of tourists and on product quality supplied by other types of accommodation in the vicinity to construct variables used to identify the quality level provided by camping sites. To avoid endogeneity concerns of the instrumental variables excluded from the price equation regionally aggregated (at the municipality level) and temporally lagged (from the summer season 2008) data is used. Information on the number overnight stays (split into the nationality of tourists) along with data on the product quality of hotels (number of stars) are provided by Statistik Austria at the municipality level. Despite the small size of municipalities[22] a particular camping site typically accounts only for a small fraction of touristic overnight stays in the respective municipality.[23]

Variables derived from this data are partially correlated with product quality (and can therefore serve as instruments) if two assumptions hold: First, tourists from different countries have to prefer different levels of product quality. This might come from differences in (average) income or from differences in preferences for product quality of tourists coming from different countries (because of e.g. historical reasons or differences in home countries' quality standards). Second, the national composition of tourists within a municipality is correlated with the national composition of tourists of all types of accommodation (within this municipality). Note that this does not preclude systematic differences in the composition of tourists across different types of accommodations (that e.g. tourists from Northern European countries are overrepresented among hotel guests and underrepresented at camping sites), as

[22]The average (median) Austrian municipality is 13.8 (9.4) square-miles large and has 3,373 (1,575) inhabitants.

[23]The mean size of a camping size is 145 pitches, whereas the capacity of hotels in the municipality where the campsites are located is on average more than 2000 beds.

long as the national composition is correlated across different types of lodging. If these assumptions hold, then (i) the national composition of tourists in the entire municipality affects the (equilibrium) quality choice of camping sites, and (ii) the quality supplied by different types of accommodations (e.g. hotels and camping sites) are correlated.

To construct variables on the national composition of tourists I group all European tourists[24] into tourists coming from Northern, Eastern, Southern and Western European countries.[25] I expect that a large share of tourists from Northern (Eastern) European countries is associated with particularly high (low) product quality, while the effect of Southern European tourists is expected to be similar to the reference group (Western Europe). As product quality provided by different types of accommodations is expected to be correlated I also include the share of all 4 and 5 star hotels among all hotels in the municipality where the camping site is located.[26]

Figure 5 and Figure 6 show the correlation between these instrumental variables and the product quality supplied by the camping sites. Figure 5 shows the average share of overnight stays from Eastern, Northern and Southern European tourists, calculated separately for each quality level. The product quality supplied by camping sites seems to be (weakly) negatively correlated with the share of tourists from Eastern European countries, whereas no particular relationship to the share of tourists from Southern Europe is exhibited. However, there is a strikingly strong (positive) correlation between the share of tourists from Northern European countries and camping sites' product quality. On the other hand, Figure 6 suggests that the quality provided by camping sites and hotels is not strongly correlated.

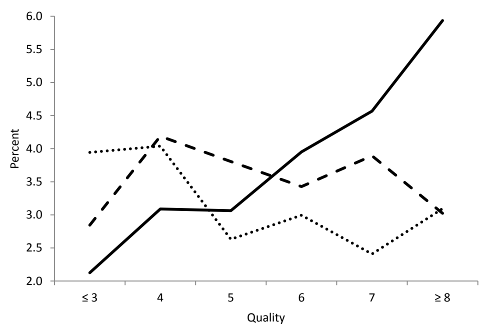
Controlling for Endogeneity of Location: In the empirical analysis a large number of variables are included to control for the endogeneity of firms' location choice. These controls include dummy variables on the district level as well as the population density of the

[24]I focus on tourists from European countries as tourists from other continents hardly ever reside at camping sites. The number of tourists from Europe accounts for more than 93% of all tourists and the correlation between the number of overnight stays of European tourists and of all tourists (irrespective of their nationality) is 99.7% in the sample used in the empirical analysis.

[25]I follow the United Nations geoscheme for Europe to group the countries and include all nations with the largest share of both population and territory located in Europe. Eastern Europe comprises Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovakia and Ukraine, Northern Europe includes Denmark, Estonia, Finland, Iceland, Ireland, Latvia, Lithuania, Norway, Sweden and the United Kingdom, Southern Europe covers Bosnia and Herzegovina, Croatia, Greece, Italy, Macedonia, Malta, Montenegro, Portugal, Serbia, Slovenia and Spain, and Western Europe summarizes Austria, Belgium, Germany, France, Liechtenstein, Luxembourg, Monaco, the Netherlands and Switzerland. There is no data available on Albania, Belarus, Moldovia and on dwarf states. Regrouping the countries such that Eastern Europe comprises all formerly Socialist countries hardly effects the results, as the number of tourists from the respective countries (affected by the regrouping) is very small.

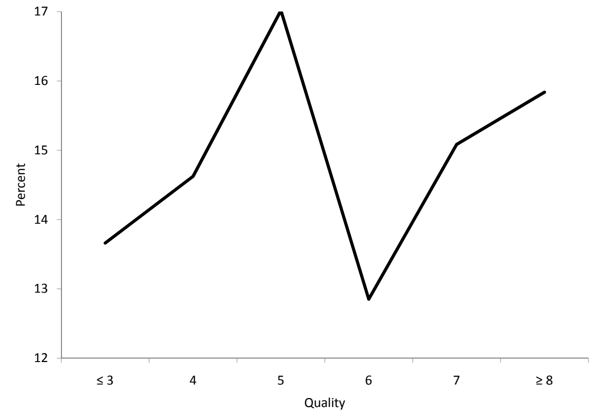
[26]Note that fixed district effects are included throughout the empirical analysis. Identification therefore stems from variation of the nationality of tourists and from the share of high quality hotels between municipalities within a district.

Figure 5: National Composition of Tourists



Notes: The solid (dotted) [dashed] line denotes the share of Tourists from Nothern (Eastern) [Southern] Europe.

Figure 6: Correlation between Quality of Hotels and Camping Sites



Notes: The solid line denotes the average share of hotels with 4 or 5 stars among all hotels in the municipality where the camping site is located.

municipality, where the camping site is located (as an indication of land prices). To control for tourism activities in the vicinity and the general attractiveness of the region I include two types of data: First, the regression considers the number of overnight stays in the municipality for the summer season 2008. This figure is normalized by the population of the municipality to control for the heterogeneity among municipalities. Second, the analysis utilizes information on other firms in the local market that supply (predominantly) tourist services. The data source ('Herold Marketing') is a telephone book including address and industry code of all firms that have a telephone (the information is therefore expected to be comprehensive).[27] The information is summarized in five categories: Tourist information (875 observations), hotels (14,477), guesthouses (9,924), restaurants (7,538) and bars/cafes (5,313).[28] The addresses are supplemented with coordinates[29] and again linked to the Austrian road system. In the regression analysis I include the driving distance from each camping site to the next tourist information and the number of hotels, guesthouses, restaurants and bars/cafes within one mile, between one and two, between two and three, and between three and four miles (driving) distance from the respective camping site. These measures are not (primarily) intended to capture direct effects on prices and quality levels, but to control for differences in demand and in the general attractiveness of regions, which is likely to affect both the firm's location choice on the one hand and price and quality on the other hand.

[27] I stick to the telephone book's own industry classification, as the industry codes of the NACE-classification are available only for a subsample.

[28] 'Hotels' capture all firms that offer (primarily) overnight stays, which includes hotels, bed and breakfasts, holidy flats, hostels and motels. Guesthouses usually offer both accommodation and meals. Bars/cafes include places which are not (primarily) offering meals like bars, pubs, clubs, ice-cream parlours and cafes.

[29] Using a program called 'GPS Visualizer', see www.gpsvisualizer.com.

Data on these firms are again from 2008 to reduce concerns about endogeneity.

Additional Covariates: Additional information on the camping sites include the size of the camping ground (measured in the number of pitches), whether the camping ground is located next to a lake, and whether the site offers an extraordinary or a nice view. The data also includes information on particular services (health treatments, spa, horse riding, water trekking) or services for particular consumer groups (families, naturists, caravan owners) as well as information on extended opening hours (winter camping). These variables cover site characteristics that cannot be changed after the location is chosen and characteristics that comprise horizontal rather than vertical product differentiation. Besides, fixed time effects are included to control for shifts in costs and demand that affect all firms similarly. Summary statistics on all variables included in the regression analysis are reported in Table 2 in Appendix B.

4 Results

To estimate the system of price and quality equation (12) and (13) a two-stage least square procedure (2SLS) is used. The regression results are summarized in Table 1. For both measures of competition the results include the price equation (column [1] and [4]), the first-stage quality equation (column [2] and [5]), and a reduced form price equation (column [3] and [6]). As the main interest of this analysis lies in the effect of competition and in the interrelation between price and quality, only estimates on the coefficients φ_p, δ_p and δ_q are reported, along with the parameter estimates on the instruments excluded from the price equation, γ_q. Regression results on other (control) variables are summarized in Table 3 in Appendix C.

When the intensity of competition is measured by the number of rivals within particular distance bands the results show that higher product quality is associated with higher prices: An increase in quality by one point increases prices by 3.6 Euros. Note that 3.6 Euros are more than 11% of the average price charged by camping sites. As long as quality is controlled for, competition has a negative impact on prices, as expected. An increase by one rival within a distance of less than two miles reduces prices by 1.3 Euros, an additional competitor within a distance between two and four miles reduces prices by 0.8 Euros. While both coefficients are statistically significant at the 5%-significance level, the effect is smaller if the distance to the new rival is larger. Contrary, product quality is positively affected by competition, and an additional rival within a distance less than two miles (between two and four miles) causes product quality to increase by 0.26 (0.08) points. The effect of competition on product quality seems to dry out more quickly with distance than its impact on prices, as the effect of the number of rivals between two and four miles is small and not statistically different from zero. On the other hand, the positive effect of the number of rivals located very close (within two miles) is statistically significant at the 1%-level. If the number of rivals increases by one standard deviation (i.e. an increase by 1.7 [1.5] competitors within two miles [between two and four miles]) the quality provided by the camping site is expected to increase by 0.55 points, which will cause prices to rise by 2.0 Euros on average. Conditional on the change in product quality, the increase in competition by one standard deviation is expected to cause prices to fall by 3.3 Euros.

A large share of high quality hotels (characterized by 4 or 5 stars) in a municipality is associated with higher quality levels supplied by camping sites. The size of the effect, however, is not significantly different from zero. In municipalities with a larger share of tourists from Eastern (Northern) European countries, camping sites offer lower (higher) product quality. Both parameter estimates take the expected sign and are significantly different from zero at the 5% level. The share of tourists from Southern European countries does not have a significant influence on product quality. A reason for this might be the large heterogeneity among these countries or (too) small differences to Western European countries (the reference category). An F-Test shows that the coefficients on all instrumental variables excluded from the price equation are jointly significance at the 5%-significance level. A robust score test developed by Wooldridge (1995) does not reject the validity of the instruments (excluded from the price equation). A robust regression-based F-test, also proposed by Wooldridge (1995), rejects the hypothesis of quality as an exogenous variable, supporting the IV-specification used in this analysis against a simple OLS-specification of both price and quality equation.

Column [3] in Table 1 reports regression results of a reduced-form price equation. According to these results the intensity of competition does influence equilibrium prices, even if the quality effect is not controlled for. The negative price effect is considerably smaller, especially for very close competitors (within two miles distance), where the coefficient drops (in absolute numbers) from 1.3 (column [1]) to 0.3 (column [3]) and is significantly different from zero at the 10%-level only.

Table 1: Regression Results

	Price	Quality	Price (reduced form)	Price	Quality	Price (reduced form)
	[1]	[2]	[3]	[4]	[5]	[6]
Quality	3.641 ***			3.700 ***		
	(1.205)			(1.240)		
# rival firms within 2 miles	-1.263 ***	0.259 ***	-0.346 *			
	(0.422)	(0.072)	(0.206)			
# rival firms between 2 and 4 miles	-0.809 **	0.077	-0.570 ***			
	(0.345)	(0.077)	(0.214)			
Average distance 3 closest rivals (in logs)				2.987 ***	-0.637 ***	0.709
				(1.085)	(0.170)	(0.598)
Share of 4 and 5 star hotels		0.804	1.885		0.825	1.699
		(0.948)	(2.677)		(0.944)	(2.714)
Share tourists Eastern Europe		-4.102 **	-14.144 **		-4.427 **	-14.457 **
		(1.978)	(6.336)		(1.963)	(6.392)
Share tourists Northern Europe		4.230 **	14.407 **		3.914 *	15.133 **
		(2.079)	(7.245)		(2.020)	(7.515)
Share tourists Southern Europe		-1.618	-17.394 **		-1.589	-14.834 **
		(2.034)	(7.297)		(2.066)	(7.003)
constant	11.386	5.033 ***	29.685 ***	5.833	6.143 ***	28.258 ***
	(7.184)	(0.930)	(2.090)	(8.756)	(0.986)	(2.203)
N	542	542	542	542	542	542
R^2	0.587	0.674	0.779	0.562	0.674	0.771
Joint-significance of Instruments $F(4, 228)$	2.46	(p = 0.046)		2.54	(p = 0.041)	
Overidentification $\chi^2(3)$	4.78	(p = 0.189)		2.89	(p = 0.409)	
Endogeneity of Quality $F(1, 228)$	6.99	(p = 0.009)		7.09	(p = 0.008)	

Regressions include locational characteristics, dummy variables for additional services of the camping site, fixed district and fixed time effects and variables controlling for the endogeneity of the location choice. Standard errors are reported in brackets and are based on standard errors that are clustered at the camping site level. * (**) [***] denotes signicant parameter estimates at the 10% (5%) [1%] significance levels. For testing exlusion restrictions (test on overidentification) a Huber/White robust estimator of the variance is used.

In column [4] to [6] competition is measured as the (logarithm of the) average distance to the three closest competitors. As in the previous specification higher quality is associated with higher prices. The size of the respective coefficient equals 3.7 and is hardly affected by the different measure of competition. As the distance is measured in logarithms, while prices and quality measures are included in levels (Euros and quality points), the estimated coefficients are semi-elasticities. A larger distance to competitors (what is associated with less intense spatial compitition) by 10% reduces product quality by 0.06 points and increses prices by 0.3 Euros. Both parameter estimates are significantly different from zero at the 1% significance level. While the coefficients are not directly comparable to those reported in column [1] and [2], the size of the effects are of a similar magnitude: If the (logarithm of the) distance to the three closest rivals is reduced by one standard deviation, quality is expected to increase by 0.56 points, which is associated with a 2.0 Euro price increase. Conditional on product quality, this increase in competition is expected to reduce prices by 2.6 Euro. Again, a larger share of tourists from Eastern (Northern) European countries is associated with lower (higher) quality. The coefficients are significantly different from zero at the 5%-level (East) and on the 10%-level (North). The parameter estimate on the share of 4 and 5 star hotels takes a positive sign (as expected), but is not significantly different from zero. The share of tourists from Southern European countries again has no (statistically significant) impact on product quality. The specification tests again suggest that the variables excluded from the price equation are jointly significant and that these variables are valid instruments. The hypothesis of quality as an exogenous variable has to be rejected at the 1%-significance level, as in the previous specification.

5 Sensitivity Analysis

To show that the results are not driven by the respective methodological approach, the specific measures of competition or a particular functional form, additional estimation experiments have been carried out to evaluate the robustness of the empirical results reported. The results on the sensitivity analyses are summarized in Appendix D and discussed in the remainder of this section:

Categorial Data: The measure of product quality used in the analysis is based on categorial (ordinal) data, because the variable is a composite index based on an (at least to some extent qualitative) evaluation of two dimensions of product quality (sanitory accessories and tent/trailer pitches). Throughout the empirical analysis this measure is treated as cardinal data. This approach is justified, as the measure is reasonably small-scale (ranging from 2 to 10). In the sensitivity analyses the quality equation was re-estimated using an ordered probit model to account for the discrete nature of the variable. The results are summarized in column [7] and [8] in Table 4. The parameter estimates of the measure of competition vary slightly by a statistically insignificant amount. The number of rivals within two miles distance significantely increases, and the average distance to the next three rivals significantly decreases firms' quality levels.

Weak Instruments: While the instruments excluded from the price equation are jointly signifiacnt in all specifications and two out of four of these variables are significantly different from zero, one may still worry about the explanatory power of the instrumental variables. I therefore apply a limited information maximum likelihood (LIML) estimator instead of the 2SLS procedure as a robustness exercise. While the large sample properties of 2SLS and LIML are the same and both methods are equivalent if the endogenous variable is just-identified[30] Mariano (2001) finds evidence in favor of the LIML estimator for small sample size and a relatively large number of overidentifying restrictions. Therefore, as noted by Baltagi (2008), the LIML estimator is 'less sensitive to weak instruments' (p. 263) and '[e]stimator bias is less of a problem for LIML than 2SLS' (p. 265). The regression results using the LIML estimator, summarized in column [9] and [10] in Table 4, support the findings of the main specifications: The effects of the intensity of competition on prices are negative, statistically significant and somewhat larger compared to the parameter estimates of the main specifications, indicating that the results of the main specifications are conservative.

Alternative Measures of Competition: As the ways to define local markets and to calculate the variables measuring the intensity of local comptition are to some extent arbitrary I use variations in the definitions of the respective variables to show the robustness of the main findings. In Table 5 different distance bands are used to construct alternative measures of competition, namely the number of competitors within one mile and between one and two miles (column [11] and [12]) and the aggregate number of rivals within a distance of up to four miles (column [13] and [14]). The results support the main findings that the intensity of competition has a positive (negative) effect on quality (price) and that the 'distance decay' of the effect of competition on product quality is much steeper and dries up more quickly than the restraining effect of spatial competition on prices. Table 6 summarizes the results when the (logarithm of the) distance to the next competitor (column [15] and [16]) or when the (logarithm of the) avarage distance to the two closest rivals (column [17] and [18]) are used to measure the intensity of competition. Whereas the distance to the two closest competitors gives very similar results as the main specification reported in column [4] and [5] in Table 1, the effect of the distance to the next rival on price and quality is (surprisingly) much weaker and not statistically different from zero. In all these variations the point estimates

[30] See Baltagi (2008) and Greene (2002) for a discussion

of product quality in the price equation are rather stable and take values between 3.3 and 3.8. These coefficients are significantly different from zero at the 1%-siginificance level in all model specification.

Functional Form: The last part of the sensitivity analysis addresses the functional form of the relationship between the measures of competition and firms' choice variables (price and quality). In this exercise I use dummy variables indicating the number of competitors within a distance of two miles instead of restricting the relationship of competition and price or competition and quality to be (log-)linear. The results are reported in Table 7 in Appendix D and illustrated in Figure 7 and 8.[31] Firms facing one competitor do not set different price and quality levels than firms without rivals: The size of both coefficients is very small. With two competitors the estimated parameters take the expected signs and increase in (absolute) value, but remain statistically insignficant. The estimated coefficients further increase in (absolute) size for three or more than three rivals and become statistically different from zero. These results support the main findings, but indicate that it does not make much difference if camping sites have one rival or none at all. An explanation for this finding could be that collusive outcomes are likely if there is only one competitor close by, but are difficult to maintain if the number of rivals increases. This explanation is also supported by the finding that the distance to the closest competitor does not influence firms' price and quality choices.

Figure 7: Non-Linear Effects of Competition on Prices

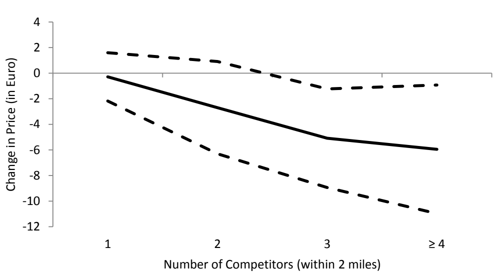
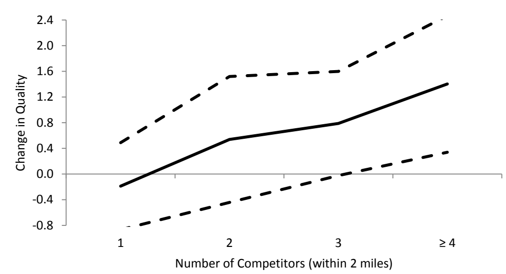


Figure 8: Non-Linear Effect of Competition on Product Quality



Notes: The solid lines denote the average effect of the number of competitors on prices (left figure) and quality (right figure) and the dotted lines indicate the 95%-confidence bands. The results are based on the parameter estimates summarized in Table 7.

Generally, the sensitivity analysis supports the main findings of the article, namely that

[31]Observations with no competitors within a two-miles distance serve as the reference category. Camping sites with more than three competitors are grouped in one class because the number of observations with more than four rivals is quite small.

competition has a positive impact on product quality and (conditional on quality) a restraining effect on prices. Note that the results are not driven by differences between rural and urban areas because district fixed effects, included in all empirical specificatins, control (at least to a large extent) for these differences. In an additional sensitivity analysis camping sites located in urban areas were excluded from the data sample, without altering the main findings.[32]

6 Discussion

This article investigates price and quality competition among camping sites in Austria as an example of a market characterized by spatial competition. The main findings are that more competition increases product quality and that higher quality has a positive effect on prices, whereas competition reduces prices (conditional on product quality). The indirect effect of competition on prices (via influencing product quality) reduces the direct effect such that the total effect of competition on prices (unconditional on product quality) is small (albeit negative), and significantly different from zero in some specifications only. In this industry consumers benefit from tough competition mainly by higher quality, and to a lesser degree by lower prices. Based on the predictions derived from the theoretical model these results suggest that the production costs of quantity and quality are substitutes. This is not surprising, as the quality index is influenced, for example, by the number of showers over the number of pitches and by the size of one pitch. The additional costs of increasing these dimensions of product quality obviously increase with output (or, more precisely, capacity). In this market cost substitutability is high enough that an increase in the number of competitors increases product quality. In such a case the theoretical model predicts that higher quality is associated with higher prices, while a larger number of rivals causes prices (conditional on product quality) to decrease (see equation (9)), which are exactly the results found in the empirical analysis.

Although product quality is an important issue, empirical evidence on the relation between competition and quality is scarce, which is especially true for spatial markets. Most articles dealing with this topic investigate the health care industry. Due to idiosyncrasies of this industry, where prices are often regulated and typically not (always) paid by consumers directly, results on this industry are usually not well-suited for generalizations. The present analysis contributes to the scarce empirical literature outside the health care market. The

[32]Excluding all camping sites located in municipalities with more than 100,000 or more than 20,000 inhabitants does affect the point estimates by a statistically insignificant amount, but does not alter the main findings. These results are not reported but are available from the author upon request.

findings of the present analysis are most closely related to the results of Domberger et al. (1995), who find qualitatively similar results, but in their analysis 'differences in predicted quality [between different levels of competition] were more modest than predicted prices' (p. 1469). Despite finding a negative price effect of competition when analyzing the cable television industry, Emmons and Prager (1997) do not find a (statistically significant) positive effect on quality. This disparity can be explained by differences in the firms' cost structure, namley that providing higher quality (i.e. additional channels) in the cable television industry is likely to affect fixed rather than variable production costs (cost independence between quality and quantity). As predicted by the theoretical mode this reduces (or possibly reverses) the positive effect of competition on product quality.[33]

The effects of competition enhancing or reducing incidents on product quality are (besides impacts on prices) important issues for competition authorities. This is especially true if providing low quality induces negative externalities. In the present example of camping sites low sanitary standards might cause ill health. Similar arguments (with evon more severe consequences) also apply for other industries like health care or food production. To assess ex-ante effects of competition enhancing policies or of a decline in the number of competitors (due to market exits or mergers) it is crucial to evaluate the cost structure (namely the degree of cost substitutability or complementarity) in the industry: If additional costs of providing high quality products are rather independent of output, more competition threatens do decrease quality levels, as the costs of providing high quality incurred by a single firm has to be borne by a smaller number of consumers. The higher the degree of cost substitutability, the higher the chances that more competition will enhance product quality.

In this article, competition is measured by the number of rivals in the vicinity. In spatial models competition can also be heightened by reducing transportation or search costs, which will lead to different policy conclusions. Brekke et al. (2010) and Gravelle (1999) find that quality is not affected by changes in transport costs (as long as utility is linear in income), even if providing high quality is associated with an increase in fixed costs only.

The present research could be extended in other directions: Unlike the camping industry many (especially retail) markets (like hotels, retail banking or clothing) are characterized by large chains controlling multiple outlets. For markets with spatial (but without vertical) product differentiation Giraud-Héraud et al. (2003) show theoretically that an increase in the number of outlets of one chain leads to price increases, as long as the outlets are spatially clustered. Pennerstorfer and Weiss (2013) provide empirical evidence for the retail gesoline market supporting this conclusion. The effects of competition in markets dominated by a

[33]The results reported in the present article are not directly comparable to the findings of Gravelle et al. (2013) – who find a negative effect of competition on prices, but no statistically significant impact on quality – due to idiosyncrasies of the health care industry.

few chains controlling large numbers of outlets on product quality is yet unexplored.

Throughout the article I have assumed that all consumers know prices and quality levels of all suppliers and act accordingly, which is a simplification typically applied in models in the spirit of Hotelling (1929) or Salop (1979). However, consumers have to incur (monetary and non-monetary) costs to search for camping sites that provide low prices and/or high quality. Guides summarizing information on these product characteristics, as the 'ADAC Camping and Caravanning Guide' used in this analysis, increase consumers' information and reduce their search costs, but introduce heterogeneity in the information endowments among consumers. Models incorporating heterogeneity in consumers' search costs (so-called 'clearinghouse models') in the spirit of Varian (1980) or Stahl (1989), who distinguish between 'informed' consumers (characterized by zero search costs) and 'uninformed' consumers (who have to pick one store randomly or have to engage in costly sequential search) find that increasing the share of 'informed' consumers reduces average prices, but predict a non-monotonous effect on price dispersion. Extending these models by incorporating vertical product differentiation could also be a fruitful exercise.

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Appendix A Formal Derivation of Equilibrium Prices and Quality

The demand for firm i, X_i, can be summarized as $X_i = L\left(d_{iz-} + d_{iz+}\right)$. Rearranging (3) gives:

$$b(q_i) - b(q_{i+1}) + u\left(Y - p_i - td_{iz+}\right) - u\left(Y - p_{i+1} - t\left(\frac{1}{n} - d_{iz+}\right)\right) = 0 \tag{14}$$

To calculate partial derivatives oft the demand $X_i(.)$, one has to get $\frac{\partial d_{iz+}}{\partial p_i}$ and $\frac{\partial d_{iz+}}{\partial q_i}$ first. $\frac{\partial d_{iz+}}{\partial p_i}$ and $\frac{\partial d_{iz+}}{\partial q_i}$ denote the change in the location (measured by the distance to firm i) of the consumer who is indifferent between buying from firm i or from firm $(i+1)$ due to a change of firm i's price or quality. These terms can be obtained by total differentiating (14). Let M denote the left-hand side of equation (14), then:

$$\begin{aligned}
&\frac{\partial M}{\partial d_{iz+}}\mathtt{d}d_{iz+} + \frac{\partial M}{\partial p_i}\mathtt{d}p_i = \\
&= -t\left[u_y\left(Y - p_i - td_{iz+}\right) + u_y\left(Y - p_{i+1} - t\left(\frac{1}{n} - d_{iz+}\right)\right)\right]\ \mathtt{d}d_{iz+} - u_y\left(Y - p_i - td_{iz+}\right)\ \mathtt{d}p_i = 0 \\
&\Rightarrow \frac{\mathtt{d}d_{iz+}}{\mathtt{d}p_i} = -\frac{u_y\left(Y - p_i - td_{iz+}\right)}{t\left[u_y\left(Y - p_i - td_{iz+}\right) + u_y\left(Y - p_{i+1} - t\left(\frac{1}{n} - d_{iz+}\right)\right)\right]}
\end{aligned} \tag{15}$$

and:

$$\begin{aligned}
&\frac{\partial M}{\partial d_{iz+}}\ \mathtt{d}d_{iz+} + \frac{\partial M}{\partial q_i}\ \mathtt{d}q_i = \\
&= -t\left[u_y\left(Y - p_i - td_{iz+}\right) + u_y\left(Y - p_{i+1} - t\left(\frac{1}{n} - d_{iz+}\right)\right)\right]\ \mathtt{d}d_{iz+} + b_q\mathtt{d}q_i = 0 \\
&\Rightarrow \frac{\mathtt{d}d_{iz+}}{\mathtt{d}q_i} = \frac{b_q}{t\left[u_y\left(Y - p_i - td_{iz+}\right) + u_y\left(Y - p_{i+1} - t\left(\frac{1}{n} - d_{iz+}\right)\right)\right]}
\end{aligned} \tag{16}$$

With consumer density L total demand for firm i can be characterized by $H \equiv \frac{\partial X_i}{\partial p_i} = -\frac{L}{t}\left\{\frac{u_y(Y-p_i-td_{iz+})}{u_y(Y-p_i-td_{iz+})+u_y\left(Y-p_{i+1}-\left(\frac{1}{n}-d_{iz+}\right)\right)} + \frac{u_y(Y-p_i-td_{iz-})}{u_y(Y-p_i-td_{iz-})+u_y\left(Y-p_{i-1}-t\left(\frac{1}{n}-d_{iz-}\right)\right)}\right\} < 0$ and $K \equiv \frac{\partial X_i}{\partial q_i} = \frac{Lb_q}{t}\left\{\frac{1}{u_y(Y-p_i-td_{iz+})+u_y\left(Y-p_{i+1}-t\left(\frac{1}{n}-d_{iz+}\right)\right)} + \frac{1}{u_y(Y-p_i-td_{iz-})+u_y\left(Y-p_{i-1}-t\left(\frac{1}{n}-d_{iz-}\right)\right)}\right\} > 0.$
The first-order condition of the profit function (4) can be stated as:

$$\frac{\partial \pi_i}{\partial p_i} = X_i(.) + (p_i - C_X(X_i(.), q_i))\frac{\partial X_i(.)}{\partial p_i} = X_i(.) - (p_i - C_X(X_i(.), q_i))H = 0 \tag{17}$$

and:

$$\begin{aligned}\frac{\partial \pi_i}{\partial q_i} = (p_i - C_X(X_i(.), q_i))\frac{\partial X_i(.)}{\partial q_i} - C_q(X_i(.), q_i) = \\ = (p_i - C_X(X_i(.), q_i))K - C_q(X(.), q_i) = 0\end{aligned} \tag{18}$$

Assuming that both direct competitors on either side of the road charge the same prices and the provide the same quality levels (i.e. $p_i = p_{-i} = p^*$ and $q_i = q_{-i} = q^*$; which is reasonable as the model is symmetric) gives $d_{iz+} = d_{iz-} = \frac{1}{2n}$ and $X_i(.) = X_{-i} = X^* = \frac{L}{n}$. The partial derivatives of the demand $X_i(.)$ simplify to $\frac{\partial X_i}{\partial p_i} = -\frac{L}{t} < 0$ and $\frac{\partial X_i}{\partial q_i} = \frac{Lb_q}{tu_y} > 0$. Equilbrium prices p^* are given by equation (5), while equilibrium quality levels q^* are implicitely characterized by equation (6).

In this model I assumed that firms are destributed equidistantly along the circular market. In equlibrium, however, no firm has an incentive to move its location by a marginal distance in one or the other direction, as the gain in consumers on one side of the road equals the loss on the other side, leaving profits unaltered.

Equilibrium existence requires that it is not profitable for firm i to lower (increase) its price (quality) such that it captures the consumer located at the location of firm $i+1$ (or $i-1$) – and therefore patronizing all of firm $i+1$'s ($i-1$'s) consumers. With linear transportation costs these conditions hold, as long as the distance between firms is large enough (see Brekke et al. (2010), footnote 15).

Appendix B Descriptive Statistics

Table 2: Descriptive Statistics on all Variables used in the Regression Analysis

Variable	# of Obs.	Mean	Std. Dev.	Min	Max
Price	551	31.92	6.54	16.58	57.82
Quality	551	6.00	1.91	2	10
# rival firms within 2 miles	551	0.87	1.69	0	10
# rival firms between 2 and 4 miles	551	0.95	1.47	0	9
Average distance 3 closest rivals (in Miles)	551	5.56	3.02	0.17	10
Average distance 3 closest rivals (in logs)	551	1.46	0.88	-1.77	2.30
Share of 4 and 5 star hotels	542	0.16	0.16	0	1
Share tourists Eastern Europe	546	0.03	0.04	0	0.35
Share tourists Northern Europe	546	0.04	0.06	0	0.40
Share tourists Southern Europe	546	0.04	0.04	0	0.51
# of overnight stays (over local residents)	548	51.47	71.71	0	391.88
Population density (# of residents / km^2)	551	238.92	601.33	2.91	3922.82
Distance to tourist information (in miles)	551	2.29	2.49	0.01	18.88
# hotels					
within 1 mile	551	8.30	14.58	0	80
between 1 and 2 miles	551	11.46	17.33	0	101
between 2 and 3 miles	551	12.07	18.39	0	128
between 3 and 4 miles	551	11.84	20.31	0	166
# guesthouses					
within 1 mile	551	2.51	3.12	0	20
between 1 and 2 miles	551	3.27	3.92	0	26
between 2 and 3 miles	551	3.97	4.82	0	31
between 3 and 4 miles	551	4.90	5.98	0	37
# restaurants					
within 1 mile	551	1.93	3.25	0	19
between 1 and 2 miles	551	3.07	6.17	0	62
between 2 and 3 miles	551	4.40	12.53	0	108
between 3 and 4 miles	551	6.31	20.56	0	172
# bars/cafes					
within 1 mile	551	1.33	2.71	0	18
between 1 and 2 miles	551	2.07	3.87	0	21
between 2 and 3 miles	551	3.32	8.61	0	81
between 3 and 4 miles	551	4.29	13.75	0	117
Additional services:					
Naturists	551	0.03	0.16	0	1
Families	551	0.16	0.37	0	1
Health treatments	551	0.03	0.16	0	1
Spa	551	0.09	0.29	0	1
Winter camping	551	0.40	0.49	0	1
Horse riding	551	0.06	0.23	0	1
Water trekking	551	0.11	0.32	0	1
Caravan owners	551	0.11	0.31	0	1
Locaction:					
next to a lake	551	0.31	0.46	0	1
extraordinary or nice view	551	0.74	0.44	0	1
Size of camping site (# of pitches)	551	145.23	113.87	30	780

Appendix C Parameter Estimates on Control Variables

Table 3: Regression Results on other included Variables

	Price		Quality		Price (red.)		Price		Quality		Price (red.)	
	[1]		[2]		[3]		[4]		[5]		[6]	
	(continued)		(continued)		(continued)		(continued)		(continued)		(continued)	
# overnight stays over population	0.001	(0.007)	-0.002	(0.002)	-0.008^{c}	(0.004)	-0.006	(0.007)	-0.001	(0.002)	-0.011^{b}	(0.004)
Population density	0.005^{c}	(0.002)	-0.001	(0.001)	0.002	(0.002)	0.005^{c}	(0.003)	-0.001	(0.001)	0.002	(0.002)
distance tourist information	-0.674^{a}	(0.238)	0.131	(0.082)	-0.207	(0.219)	-0.718^{a}	(0.266)	0.149^{c}	(0.079)	-0.174	(0.224)
# hotels												
within 1 mile	0.026	(0.041)	0.002	(0.011)	0.035	(0.029)	0.049	(0.042)	-0.001	(0.010)	0.049^{c}	(0.029)
between 1 and 2 miles	-0.029	(0.041)	0.017^{b}	(0.008)	0.036^{c}	(0.021)	-0.034	(0.046)	0.018^{b}	(0.009)	0.035	(0.022)
between 2 and 3 miles	0.122^{a}	(0.045)	-0.016^{c}	(0.008)	0.062^{b}	(0.028)	0.119^{b}	(0.048)	-0.016^{c}	(0.009)	0.056^{c}	(0.030)
between 3 and 4 miles	0.022	(0.030)	0.001	(0.006)	0.027	(0.024)	0.019	(0.030)	0.000	(0.006)	0.020	(0.022)
# guesthouses												
within 1 mile	-0.552^{b}	(0.275)	0.139^{b}	(0.057)	-0.070	(0.141)	-0.598^{b}	(0.297)	0.146^{b}	(0.057)	-0.081	(0.143)
between 1 and 2 miles	-0.536^{b}	(0.218)	0.082^{c}	(0.048)	-0.270^{c}	(0.141)	-0.539^{b}	(0.227)	0.081^{c}	(0.048)	-0.263^{c}	(0.142)
between 2 and 3 miles	-0.572^{a}	(0.190)	0.094^{b}	(0.039)	-0.226^{c}	(0.127)	-0.573^{a}	(0.195)	0.095^{b}	(0.040)	-0.217	(0.133)
between 3 and 4 miles	-0.148	(0.133)	0.029	(0.037)	-0.035	(0.097)	-0.140	(0.135)	0.029	(0.037)	-0.027	(0.094)
# restaurants												
within 1 mile	0.762^{a}	(0.278)	-0.081	(0.065)	0.456^{b}	(0.207)	0.661^{b}	(0.269)	-0.072	(0.064)	0.377^{c}	(0.201)
between 1 and 2 miles	0.519^{b}	(0.229)	-0.052	(0.060)	0.356^{b}	(0.148)	0.455^{b}	(0.228)	-0.044	(0.058)	0.315^{b}	(0.147)
between 2 and 3 miles	0.080	(0.168)	0.015	(0.044)	0.121	(0.125)	0.100	(0.171)	0.010	(0.045)	0.115	(0.126)
between 3 and 4 miles	-0.066	(0.172)	-0.054	(0.033)	-0.257^{b}	(0.126)	-0.038	(0.172)	-0.055^{c}	(0.033)	-0.232^{c}	(0.129)
# bars/cafes												
within 1 mile	-0.796^{a}	(0.272)	0.000	(0.076)	-0.760^{a}	(0.244)	-0.743^{a}	(0.269)	0.000	(0.074)	-0.709^{a}	(0.237)
between 1 and 2 miles	-0.076	(0.246)	-0.022	(0.063)	-0.154	(0.183)	0.066	(0.254)	-0.044	(0.064)	-0.092	(0.187)
between 2 and 3 miles	-0.072	(0.213)	0.019	(0.056)	0.015	(0.128)	-0.077	(0.219)	0.025	(0.057)	0.036	(0.128)
between 3 and 4 miles	0.051	(0.230)	0.046	(0.046)	0.200	(0.179)	0.048	(0.232)	0.044	(0.046)	0.188	(0.182)
Additional services:												
Naturists	2.371	(1.888)	-0.667	(0.605)	-0.132	(2.897)	2.824	(2.060)	-0.822	(0.635)	-0.281	(2.939)
Families	-1.608	(2.143)	1.358^{a}	(0.407)	3.176^{a}	(0.899)	-1.448	(2.124)	1.296^{a}	(0.410)	3.190^{a}	(0.933)
Health treatments	-10.575^{c}	(5.444)	3.384^{a}	(0.545)	2.000	(2.763)	-10.581^{c}	(5.437)	3.335^{a}	(0.534)	2.064	(2.638)
Spa	2.887^{b}	(1.375)	0.431	(0.390)	4.554^{a}	(1.102)	2.899^{b}	(1.444)	0.486	(0.398)	4.768^{a}	(1.128)
Winter camping	-0.299	(1.619)	0.821^{c}	(0.456)	3.021^{a}	(0.951)	-0.216	(1.708)	0.798^{c}	(0.459)	3.020^{a}	(0.945)
Horse riding	-0.988	(1.390)	0.428	(0.496)	0.572	(1.352)	-0.781	(1.400)	0.355	(0.505)	0.498	(1.401)
Water trekking	-1.941	(1.292)	0.707^{b}	(0.354)	0.535	(1.051)	-2.246^{c}	(1.341)	0.796^{b}	(0.351)	0.499	(1.059)
Caravan owners	-1.715	(1.780)	1.000^{a}	(0.343)	1.779^{c}	(0.913)	-1.854	(1.846)	1.028^{a}	(0.348)	1.851^{b}	(0.933)
Locaction:												
next to a lake	2.475^{b}	(1.117)	-0.383	(0.326)	1.091	(0.790)	2.049^{c}	(1.156)	-0.341	(0.323)	0.807	(0.818)
extraordinary or nice view	-2.298	(1.417)	0.891^{a}	(0.320)	1.152	(0.957)	-2.866^{c}	(1.508)	0.975^{a}	(0.313)	0.865	(0.974)
Size of camping site (# of pitches)	0.003	(0.004)	0.001	(0.001)	0.006	(0.004)	0.004	(0.004)	0.001	(0.001)	0.007	(0.004)

Regressions include fixed district and fixed time effects. Standard errors are reported in brackets and are clustered at the camping site level.
^{a} (^{b}) [^{c}] denotes signicant parameter estimates at the 1% (5%) [10%] significance levels.

Appendix D Robustness

Table 4: Regression Results using Alternative Estimation Techniques

	Quality	Quality	Price	Price
	[7]	[8]	[9]	[10]
Method	ordered probit	ordered probit	LIML	LIML
Quality			4.196 ***	4.106 ***
			(1.573)	(1.501)
# rival firms within 2 miles	0.244 ***		-1.410 ***	
	(0.070)		(0.520)	
# rival firms between 2 and 4 miles	0.084		-0.851 **	
	(0.077)		(0.390)	
Average distance 3 closest rivals (in logs)		-0.591 ***		3.251 ***
		(0.154)		(1.248)
Share of 4 and 5 star hotels	0.770	0.792		
	(0.923)	(0.917)		
Share tourists Eastern Europe	-3.771 *	-4.019 **		
	(1.979)	(1.935)		
Share tourists Northern Europe	4.112 **	3.813 **		
	(1.886)	(1.846)		
Share tourists Southern Europe	-1.883	-1.896		
	(1.726)	(1.752)		
constant			8.633	3.378
			(9.034)	(10.354)
N	542	542	542	542
R^2	0.286	0.286	0.492	0.492
Pseudo log-likelihood	-784.620	-785.117		
Joint-significance of Instruments	$\chi^2(4)$	$\chi^2(4)$	$F(4, 228)$	$F(4, 228)$
	12.34	12.45	2.54	2.46
	(p = 0.015)	(p = 0.014)	(p = 0.041)	(p = 0.046)
Overidentification				
Anderson-Rubin $\chi^2(3)$			2.22	3.08
			(p = 0.529)	(p = 0.380)
Basmann $F(3, 439)$			0.60	0.83
			(p = 0.616)	(p = 0.479)

Regressions include locational characteristics, dummy variables for additional services of the camping site, fixed district and fixed time effects and variables controlling for the endogeneity of the location choice. Standard errors are reported in brackets and are based on standard errors that are clustered at the camping site level. * (**) [***] denotes signicant parameter estimates at the 10% (5%) [1%] significance levels. For testing Anderson-Rubin's χ^2 and Basmann F test statistic non-robust standard errors are used. R^2-statistics on specification [7] and [8] denote pseudo-R^2 statistics. Parameter estimates on first-stage quality equations for specifications [9] to [10] are equal to the results of specification [2] and [5] and are therefore not reported.

Table 5: Regression Results using Alternative Measures of Competition (I)

	Price [1]		Quality [2]		Price [11]		Quality [12]		Price [13]		Quality [14]	
Quality	3.641	***			3.761	***			3.569	***		
	(1.205)				(1.240)				(1.183)			
# rival firms within 1 mile					-1.354	**	0.380	***				
					(0.630)		(0.108)					
# rival firms between 1 and 2 miles					-1.382	***	0.139					
					(0.447)		(0.109)					
# rival firms within 2 miles	-1.263	***	0.259	***								
	(0.422)		(0.072)									
# rival firms between 2 and 4 miles	-0.809	**	0.077									
	(0.345)		(0.077)									
# rival firms within 4 miles									-1.039	***	0.174	***
									(0.289)		(0.049)	
Share of 4 and 5 star hotels			0.804				0.800				0.801	
			(0.948)				(0.957)				(0.943)	
Share tourists Eastern Europe			-4.102	**			-4.250	**			-4.113	**
			(1.978)				(1.980)				(1.982)	
Share tourists Northern Europe			4.230	**			4.018	*			4.377	**
			(2.079)				(2.089)				(2.076)	
Share tourists Southern Europe			-1.618				-2.106				-1.475	
			(2.034)				(1.965)				(2.029)	
constant	11.386		5.033	***	10.555		5.136	***	11.715	*	5.037	***
	(7.184)		(0.930)		(7.450)		(0.923)		(7.085)		(0.958)	
N	542		542		542		542		542		542	
R^2	0.587		0.674		0.554		0.675		0.596		0.670	
Joint-significance of Instruments $F(4, 228)$	2.46		(p = 0.046)		2.56		(p = 0.039)		2.54		(p = 0.041)	
Overidentification $\chi^2(3)$	4.78		(p = 0.189)		2.24		(p = 0.524)		5.32		(p = 0.150)	
Endogeneity of Quality $F(1, 228)$	6.99		(p = 0.009)		7.70		(p = 0.006)		6.73		(p = 0.010)	

Regressions include locational characteristics, dummy variables for additional services of the camping site, fixed district and fixed time effects and variables controlling for the endogeneity of the location choice. Standard errors are reported in brackets and are based on standard errors that are clustered at the camping site level. * (**) [***] denotes signicant parameter estimates at the 10% (5%) [1%] significance levels. For testing exlusion restrictions (test on overidentification) a Huber/White robust estimator of the variance is used.

Table 6: Regression Results using Alternative Measures of Competition (II)

	Price [3]	Quality [4]	Price [15]	Quality [16]	Price [17]	Quality [18]
Quality	3.700 ***		3.537 ***		3.272 ***	
	(1.240)		(1.205)		(1.088)	
Distance to closest rivals (in logs)			0.623	-0.134		
			(0.408)	(0.113)		
Average distance 2 closest rivals (in logs)					2.079 ***	-0.534 ***
					(0.792)	(0.145)
Average distance 3 closest rivals (in logs)	2.987 ***	-0.637 ***				
	(1.085)	(0.170)				
Share of 4 and 5 star hotels		0.825		0.690		0.753
		(0.944)		(0.973)		(0.942)
Share tourists Eastern Europe		-4.427 **		-4.340 **		-4.952 **
		(1.963)		(2.091)		(2.071)
Share tourists Scandinavia		3.914 *		4.377 **		4.442 **
		(2.020)		(2.184)		(2.052)
Share tourists Southern Europe		-1.589		-2.379		-1.255
		(2.066)		(2.237)		(2.098)
constant	5.833	6.143 ***	10.303	5.339 ***	9.780	5.880 ***
	(8.756)	(0.986)	(7.561)	(0.966)	(7.407)	(0.961)
N	542	542	542	542	542	542
R^2	0.562	0.674	0.554	0.656	0.620	0.674
Joint-significance of Instruments $F(4, 228)$	2.54	(p = 0.041)	2.78	(p = 0.028)	2.94	(p = 0.022)
Overidentification $\chi^2(3)$	2.89	(p = 0.409)	1.05	(p = 0.789)	3.55	(p = 0.315)
Endogeneity of Quality $F(1, 228)$	7.09	(p = 0.008)	7.34	(p = 0.007)	6.02	(p = 0.015)

Regressions include locational characteristics, dummy variables for additional services of the camping site, fixed district and fixed time effects and variables controlling for the endogeneity of the location choice. Standard errors are reported in brackets and are based on standard errors that are clustered at the camping site level. * (**) [***] denotes signicant parameter estimates at the 10% (5%) [1%] significance levels. For testing exlusion restrictions (test on overidentification) a Huber/White robust estimator of the variance is used.

Table 7: Regression Results with Non-Linear Effects of Competition

	Price [19]		Quality [20]	
Quality	3.379	***		
	(1.157)			
1 rival firm within 2 miles	-0.288		-0.189	
	(0.962)		(0.346)	
2 rival firms within 2 miles	-2.697		0.538	
	(1.840)		(0.500)	
3 rival firms within 2 miles	-5.085	***	0.788	*
	(1.967)		(0.414)	
4 or more rival firms within 2 miles	-5.951	**	1.403	***
	(2.564)		(0.542)	
Share of 4 and 5 star hotels			1.114	
			(0.976)	
Share tourists Eastern Europe			-3.610	*
			(2.076)	
Share tourists Northern Europe			4.516	**
			(2.088)	
Share tourists Southern Europe			-2.568	
			(2.132)	
constant			5.040	***
			(0.906)	
N	542		542	
R^2	0.671		0.602	
Joint-significance of Instruments $F(4, 228)$		2.73	(p = 0.030)	
Overidentification $\chi^2(3)$		2.78	(p = 0.428)	
Endogeneity of Quality $F(1, 228)$		6.27	(p = 0.013)	

Regressions include locational characteristics, dummy variables for additional services of the camping site, fixed district and fixed time effects and variables controlling for the endogeneity of the location choice. Standard errors are reported in brackets and are based on standard errors that are clustered at the camping site level. * (**) [***] denotes signicant parameter estimates at the 10% (5%) [1%] significance levels. For testing exlusion restrictions (test on overidentification) a Huber/White robust estimator of the variance is used.