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COMPETITION BETWEEN AND WITHIN TOURIST DESTINATIONS

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Competition between and within tourist destinations

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Abstract The aim of this paper is to analyze theoretically two levels of competition that are relevant in tourism markets, i.e. *between* and *within* tourist destinations. In particular, the focus of this paper lies in the relationship between the degree of (exogenous) differentiation between destinations and the (endogenous) degree of competition within the destination. Our main result is that an increase in the intensity of competition between destinations induces destination managers to increase competition within each destination. When the intensity of competition between destinations increases, the incentives to increase the intensity of competition within the destination are higher, since the subsequent increase in price leads to a larger gain in market shares. However, the strategy is followed by all destinations, with the consequence that firms' profits in both destinations are dispersed in a "prisoner's dilemma" scenario, reinforcing the negative effect of the increase in between destinations competition.

1. Introduction

In tourism, competition occurs at two levels. First, competition occurs among tourist destinations, countries or regions. If we consider countries as level of analysis, recent years have witnessed a significant increase in the degree of international competition, triggered by factors like the reduction of transportation costs and the ICT revolution. New destinations emerged, leading to a sharp reduction in the concentration of international arrivals. Second, competition occurs among firms offering similar goods or services and located in the same tourist destination. This paper will focus on accommodation, where recent years have witnessed an increase in supply in most countries which can be interpreted an increase of competition within each destination.

The aim of this paper is to analyze theoretically the interplay between the two levels of competition, *between* and *within* tourist destinations. In the model, two destinations compete for tourists from the rest of the world. The destinations are differentiated both vertically and horizontally. Differentiation is related to natural and cultural attractions that are present in the destination, and to geographical distance from tourists' place of origin. The degree of differentiation between destinations is exogenous.

In each destination, tourists consume a single "good", i.e. hospitality. Within each destination, hospitality is a homogenous good offered by hotels located in the destination. Homogeneity implies that hotels within each destination face the same price, are of the same size and obtain the same profits. However, given differentiation between destinations, price, hotels' size and profits differ between destinations.

The destination manager in each destination chooses the number of hotels, in order to maximize hotels total profits in the destination in a simultaneous-move game. Choosing the number of firms, the destination manager determines the intensity of competition within the destination, and ultimately the price of accommodation.

The focus of this paper lies in the relationship between the degree of (exogenous) differentiation between destinations and the (endogenous) degree of competition within the destination. Our main result is that an increase in the intensity of competition between destinations induces destination managers to increase competition within destination. When the intensity of competition between destinations increases, the incentives to increase the intensity of competition within the destination are higher,

since the subsequent increase in price leads to a larger gain in market shares. However, this strategy is followed by both destinations, with the consequence that hotels profits in both destinations are dispersed in a "prisoner's dilemma" scenario.

Recent papers investigated each single level of competition in isolation. For instance, Cellini and Candela (2006) consider a dynamic model of competition between tourist destinations, which are taken as the sole unit of analysis. Strategic pricing of hotels has been considered by Mudambi (1994), while Pintassilgo and Silva (2007) modelled the effect of hotels' entry and environmental quality in a single destination. Calveras (2007) models the formation of hotel chains in the case of two destinations, but he takes as given the initial number of hotels. Some papers have considered other type of relations between tourist firms than competition. Calveras and Vera-Hernandez (2005) investigate the vertical relations between tour operators and hotels, and their impact on environmental qualities, within a destination. Wachsman (2006) models the strategic interaction between hotels and airlines, when two destinations compete, and one hotel and one airline operate in each destination. To our knowledge, this is the first paper to consider the interaction between the two levels of competition. [1]

The rest of paper is organized as follows. In Section 2 the model is introduced and solved. In Section 3, we derive the main implications of the model, and we discuss them in Section 4. Section 5 concludes and points at further extensions of the model.

2. The model

2.1 The set-up

Our model considers competition between two destinations (destinations 1 and 2) for attracting tourist from the rest of the world. Tourists consume a single good, i.e.

[1] With respect to the international trade literature, our model shows similarities with Richardson (1999). This author considers the competition between two countries, whose firms offer homogenous product. Government chooses trade policies (the level of trade tariffs) and competition policies (the number of firms in each country). To this set-up, we add horizontal and vertical differentiation between the "products" offered by firms in each country.

hospitality, which is offered by competing hotels in each destination, and destination managers decide the number of hotels in their managed destination.

The model assumes two stages. In the first stage, destination managers choose simultaneously the number of hotels in the destination. The assumption that the number of firms is chosen by government in the accommodation sector is not too unrealistic. Operating a hotel usually requires an authorization, and in any case governments have the power to influence the extension of the area in which hotels can be built. In the second stage, hotels compete *à la* Cournot, choosing quantities (i.e. their size). Following Kreps and Scheinkman (1983), we interpret the Cournot game as the reduced form of a game where firms choose first their productive capacity and then compete in prices. Since capacity constraints are relevant for hotels, Cournot competition appears as a reasonable assumption. From tourists' point of view, the good is homogenous within the destination but differentiated across destinations.[2] The interpretation of this assumption is that, while the accommodation services offered by hotels are homogenous, destinations are vertically and horizontally differentiated for non-traded characteristics, such as natural or cultural attractions, and horizontally differentiated according to the geographical distance from the tourist place of origin.

In the second stage, the number of firms in each destination is given. I is the set of firms in destination 1, n_1 is the number of firms and $i \in I$ the generic firm. Similarly, J is the set of firms in destination 2, n_2 is the number of firms and $j \in J$ the generic firm. Firms (independently from their location) have identical costs functions with zero fixed costs and marginal costs normalized to zero as well.
Inverse demand function in destination 1 and 2 are assumed to be linear, and they are respectively:

$$p_1 = A_1 - \sum_{i \in I} q_i - \lambda \sum_{j \in J} q_j \qquad (1)$$

[2] In the international trade literature, the hypothesis of differentiation by country of origin is known as "Armington hypothesis", following Armington (1969).

$$p_2 = A_2 - \sum_{i \in I} q_i - \lambda \sum_{j \in J} q_j \tag{2}$$

A_1 and A_2 are positive parameters related to consumers willingness to pay, or market size, in each destination. We allow for asymmetries between destinations (while assuming, without loss of generality, that $A_1 > A_2$), and then $A_1 - A_2$ is a measure of degree of vertical differentiation. $\lambda \in [0;1)$ is a measure of substitutability between products offered in the two destinations, then an inverse measure of horizontal differentiation and a direct measure of intensity of competition.

In the first stage, destination managers choose simultaneously the number of hotels in their destination. Their objective function is given by destination hotels total profits in the second stage (which is correctly predicted), i.e. $W_1(n_1) = \sum_{i \in I} \Pi_i$ and $W_2(n_2) = \sum_{j \in J} \Pi_j$. This hypothesis is justified by tourists not being destinations' citizens.

2.2 The second stage

We solve the model backwards. In the second stage, generic firms *i* and *j* chooses q_i and q_j in order to maximize their profits, which are respectively:

$$\Pi \equiv \left(A_1 - \sum_{i \in I} q_i - \lambda \sum_{j \in J} q_j \right) q_i \tag{3}$$

$$\Pi_j \equiv \left(A_2 - \sum_{j \in J} q_j - \lambda \sum_{i \in I} q_i \right) q_j \tag{4}$$

The first order conditions are:

$$\frac{\partial \Pi}{\partial q_i} \equiv \left(A_1 - \sum_{i \in I} q_i - \lambda \sum_{j \in J} q_j \right) - q_i = 0 \tag{5}$$

$$\frac{\partial \Pi}{\partial q_j} \equiv \left(A_2 - \sum_{j \in J} q_j - \lambda \sum_{i \in I} q_i \right) - q_j = 0 \tag{6}$$

Invoking symmetry, $q_i = q_1 \ \ \forall i \in I$, and $q_j = q_2 \ \ \forall j \in J$ we obtain:

$$A_1 - n_1 q_1 - \lambda n_2 q_2 - q_1 = 0 \tag{7}$$

$$A_2 - n_2 q_2 - \lambda n_1 q_1 - q_2 = 0 \tag{8}$$

In equilibrium, the quantity produced by the representative firm in each destination is:

$$q_1^* = \frac{A_1 + n_2 (A_1 - \lambda A_2)}{1 + n_1 + n_2 + n_1 n_2 (1 - \lambda^2)} \tag{9}$$

$$q_2^* = \frac{A_2 + n_1 (A_2 - \lambda A_1)}{1 + n_1 + n_2 + n_1 n_2 (1 - \lambda^2)} \tag{10}$$

Plugging (9) and (10) into (3) and (4), we get equilibrium profits for the representative firms in destination 1 and 2 as $\Pi_1^* = (q_1^*)^2$ and $\Pi_2^* = (q_2^*)^2$.

The comparative statics on Eqs (10) and (11) provides the expected results. Focusing on destination 1 (the case for destination 2 is symmetric), we obtain that an increase in destination quality, as measured by A_1, has a positive effect on hotel size in equilibrium:

$$\frac{\partial q_1^*}{\partial A_1} = \frac{1 + n_2}{1 + n_1 + n_2 + n_1 n_2 (1 - \lambda^2)} > 0 \tag{11}$$

since an increase in A_1 leads to higher marginal revenues for any level of q_1. For a symmetric argument, an increase in the quality of the other destination (an increase in A_2) has a negative effect, unless $\lambda = 0$:

$$\frac{\partial q_1^*}{\partial A_1} = \frac{-\lambda n_2 A_2}{1 + n_1 + n_2 + n_1 n_2 (1 - \lambda^2)} < 0 \tag{12}$$

An increase in the intensity of competition, both within destination (increase in n_1) and in the other destination (increase in n_2) leads to lower size in equilibrium:

$$\frac{\partial q_1^*}{\partial n_1} = \frac{-(1+n_2(1-\lambda^2))(A_1 + n_2(A_1 - \lambda A_2)}{1+n_1+n_2+n_1n_2(1-\lambda^2)} < 0 \tag{13}$$

$$\frac{\partial q_1^*}{\partial n_2} = \frac{-\lambda(A_1 + n_2(A_1 - \lambda A_2)}{1+n_1+n_2+n_1n_2(1-\lambda^2)} < 0 \tag{14}$$

Finally, we consider the effect of variation of λ on hotels' size in equilibrium:

$$\frac{\partial q_1^*}{\partial \lambda} = \frac{-n_2\left[(1+n_2)(A_2 - \lambda A_1) - \lambda n_1(A_1 + n_2(A - \lambda A_2)\right]}{1+n_1+n_2+n_1n_2(1-\lambda^2)} \tag{15}$$

(15) has an ambiguous sign. In order to provide an easier interpretation, consider a symmetric situation where $n_1 = n_2 = n$. This means that the sign of $\frac{\partial q_1^*}{\partial \lambda}$ is the sign of $(1+n) - \lambda n > 0$, that is $\frac{\partial q_1^*}{\partial \lambda} > 0$ if $\lambda < \frac{n}{1+n}$. The relationship between hotel size and the intensity of competition is U-shaped. This result comes from two opposing effects. An increase in λ means lower price for given quantity offered by foreign hotels, which has a negative effect on q_1^*; however, it also increases the demand elasticity of the individual firm, leading to larger output by each hotel. It turns out that the sum of the two effects is minimized at an intermediate value of λ.

2.3 The first stage

In the first stage, destination managers choose simultaneously the number of firms active in destination. We assume that destination manager maximize the total profits of hotels in the destination:

$$\max_{n_1} W_1(n_1) = n_1(q_1^*)^2 \tag{16}$$

$$\max_{n_2} W_2(n_2) = n_2 (q_2^*)^2 \tag{17}$$

The first order conditions are:

$$\frac{\partial W_1}{\partial n_1} \equiv \left(\frac{A_1 + n_2(A_1 - \lambda A_2)}{1 + n_1 + n_2 + n_1 n_2 (1-\lambda^2)} \right)^2 - 2 n_1 q_1 \frac{A_1 + n_2(A_1 - \lambda A_2)}{1 + n_1 + n_2 + n_1 n_2 (1-\lambda^2)} (1 + n_2 (1-\lambda^2)) = 0 \tag{18}$$

$$\frac{\partial W_2}{\partial n_2} \equiv \left(\frac{A_2 + n_1(A_2 - \lambda A_1)}{1 + n_1 + n_2 + n_1 n_2 (1-\lambda^2)} \right)^2 - 2 n_2 q_2 \frac{A_2 + n_1(A_2 - \lambda A_1)}{1 + n_1 + n_2 + n_1 n_2 (1-\lambda^2)} (1 + n_1 (1-\lambda^2)) = 0 \tag{19}$$

Those conditions can be simplified and become:

$$\frac{\partial W_1}{\partial n_1} \equiv \left(1 + n_1 + n_2 + n_1 n_2 (1-\lambda^2)\right) - 2 n_1 (1 + n_2 (1-\lambda^2)) = 0 \tag{20}$$

$$\frac{\partial W}{\partial n_2} \equiv \left(1 + n_1 + n_2 + n_1 n_2 (1-\lambda^2)\right) - 2 n_2 (1 + n_1 (1-\lambda^2)) = 0 \tag{21}$$

Eqs (20) and (21) implicitly define the best response function for each destination manager, i.e. the number of hotels which maximize hotels total profits given the number of hotels in the other destination. In an explicit form, the best response functions respectively appear as:

$$n_1 = BR_1(n_2) = \frac{1 + n_2}{1 + n_2 (1-\lambda^2)} \tag{22}$$

$$n_2 = BR_2(n_1) = \frac{1 + n_1}{1 + n_1 (1-\lambda^2)} \tag{23}$$

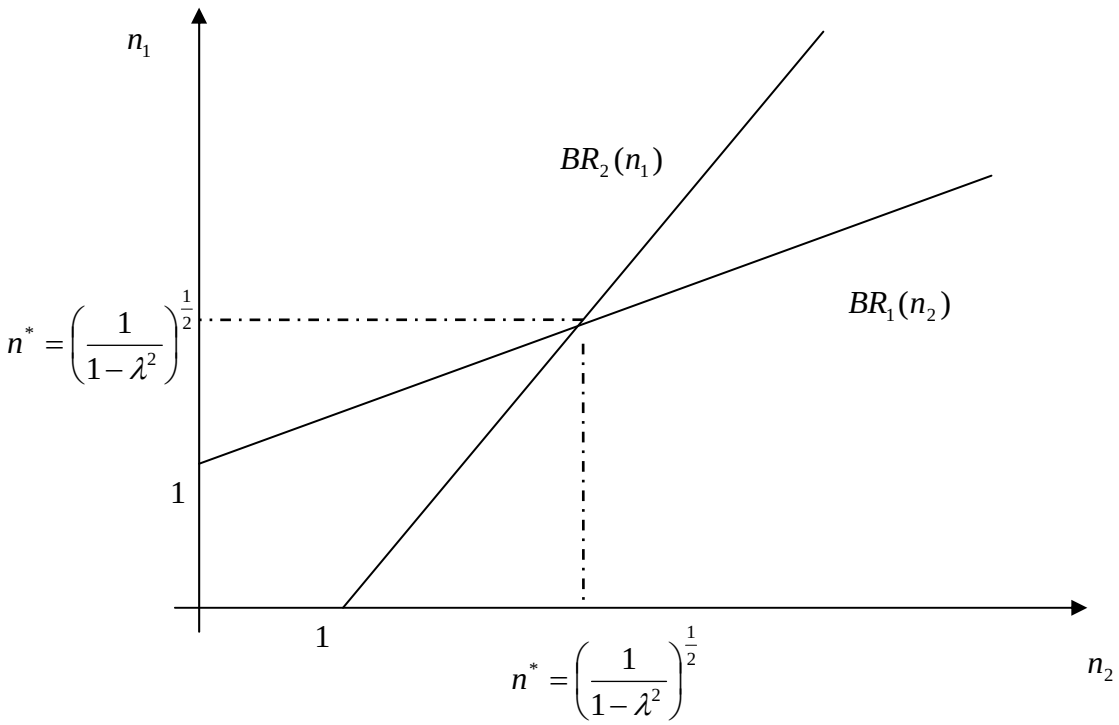
We analyze now the slopes of best response functions. Considering destination 1 and deriving, we obtain:

$$\frac{dn_1}{dn_2} = \frac{\lambda^2}{1 + n_2 (1-\lambda^2)} \tag{24}$$

which is always positive. In the terminology of Bulow et al. (1985), the game played by the destination managers is a game with strategic complements. We represent the two best response functions in Figure 1. The Nash equilibrium is given by their intersection. The graphical representation, together with economic intuition, suggests that the equilibrium is symmetric. Then, imposing $n_1 = n_2 = n^*$ in Eqs. (20) and (21), we obtain:[3]

$$n^* = \left(\frac{1}{1-\lambda^2} \right)^{\frac{1}{2}} \tag{25}$$

Figure 1: Best response functions and equlibrium



3. Between and within destination competition

In this paper, our focus lies in the relation between the intensity of competition between destination (which is assumed to exogenous) and the intensity of competition within a

[3] It can be verified that second order conditions are satisfied. We shall assume that parameters are such that interiority of equilibrium is guaranteed in both destinations.

destination, which is endogenous and measured by the number of firms which operate in the destination.

The first thing we note from Eq. (25) is that the number of hotels active in each destination is independent from A_1 and A_2. This leads to our first proposition:

Proposition 1: *The number of firms active in each destination is the same and independent from destination quality.*

A_1 and A_2 affect the size of hotels in equilibrium (the larger is the market size of a destination, the larger is the size of hotels in equilibrium in the destination), but not the number of hotels.

In order to understand the intuition, consider the case of $\lambda = 0$ (i.e. destinations are local monopolists). In this case, $n^* = 1$. Independently from market size, local government willing to maximize industry choose monopoly, because any market structure would disperse profits. The same logic extends to $\lambda > 0$. In this result, the assumption of homogenous hotels is crucial. In presence of within-destination product differentiation, hotels could create their own demand, with limited "business stealing" effects.

From Eq. (25) we see instead that the number of hotels chosen by the local government is increasing in λ, since:

$$\frac{dn^*}{d\lambda} = \lambda(1-\lambda^2)^{-\frac{3}{2}} > 0 \qquad (26)$$

Proposition 2: *the number of hotels active in each destination, and then the intensity of competition within the destination, is increasing in the intensity of competition between the destinations.*

The intuition of this result is the following. We first note that equilibrium number of hotels results from the interaction of two forces operating in opposite directions. First, there is a "profit dissipating" effect: when a local government increases the number of hotels, part of the profits within the destination are dispersed for the increase in

competition. Second, there is a "market share" effect. An increase in the number of firms in a destination, given the number of firms in the other destination, leads to a reduction in price, and then an increase in destination market share.

When the horizontal differentiation between the two destinations is low, a given reduction a price has a significant effect on destination "sales". For this reason, local government find aggressive price strategies attractive, exactly as firms do in standard models of oligopoly interaction (Tirole, 1988). The way in which local governments "control" prices is through the intensity of competition within the destination: the higher is the intensity, the lower is the price. Then, an increase in λ leads to an increase in the number of firms. From the point of view of overall welfare in the world tourism market, Proposition 2 implies that an increase in the intensity of competition between destinations redistribute wealth from destination places to origin places through two effects: a direct effect (for given number of firms in each destination) and indirect (induced) effect, operating for the variation in number of firms, which *reinforces* the direct effect.

4. Discussion

In this section we discuss some implications of the results we obtained, and, at the same time, we discuss how the results could vary if some assumptions are relaxed.

The main point of this paper is that an increase in competition between destinations leads destination managers towards a policy intervention (increasing the intensity of competition within the destination) which in fact worsens overall firms performance in the destination, although maximizing firms profit is the destination manager's objective. This apparently paradoxical result can be understood if one considers that destination managers are not concerned with incumbent (i.e. before the increase in competition) hotels only, but with potential entrants as well. In fact, one could argue that for "political economy" considerations incumbent hotels could "lobby" to avoid an increase in the number of firms. Interestingly, notice that the ability of destination managers to commit to a given number of firms in face of increased competition would benefit the destination, by increasing welfare as we defined it.

A second point relates to the possible presence of externalities that we rule out by assumption. The first type of externality is dynamic, and it refers to the negative effect of the number of firms on environmental quality, as in Pintassilgo and Silva (2007). If local governments fail to internalize this effect, our model suggests that increased in competition between destinations can harm tourism sustainability in the long run, a result which appears consistent with anectodical evidence. Another type of externality could occur to respect to destination residents. In principle, negative or positive externality could exist, which would imply a number of hotels which is higher or lower than the social optimum, if governments fail to consider the effects on residents.

Finally, there are two main policy implications from our results. The first one refers to the opportunity of coordination if the two destinations belong to the same political entity. The prisoner's dilemma type of game, indeed, implies that in this case destinations would be better off if the choice of competition intensity within each destination is centralized in a single authority. The second implication refers to the nature of competition among destinations. In this paper, in fact, we focused on price competition, since prices are what destination managers control "manipulating" the level of competition in their destinations. Price competition, however, tends to harm firms (in favour consumers). This is true for tourist destinations as well. One could imagine a set-up where tourism competition is influenced by investments in destination quality or characteristics. In this scenario, destination managers could in fact try to reduce the intensity of price competition by increasing the "artificial" level of differentiation among destinations.

5. Conclusions

In this paper we presented a model that investigates the interplay of competition within and between tourist destinations. The focus lies in the relationship between the degree of (exogenous) differentiation between destinations and the (endogenous) degree of competition within the destination. Our main result is that an increase in the intensity of competition between destinations induces destination managers to increase competition within the destination. This implies that an increase in the intensity of competition between destinations redistributes wealth from destination places to origin places

through two effects: a direct effect (for given number of firms in each destination) and an indirect (induced) effect, operating for the variation in the number of firms, which *reinforces* the direct effect. Several extensions of the model are possible, some of them mentioned in the previous section. In general, one could imagine of enriching both the description of competition between destinations, and the nature of destination as a system of firms. At the level of competition among destinations, one could have a dynamic model in which the degree of vertical and horizontal differentiation is endogenous. At the level of destination system, an interesting venue could be the analysis of firms offering different type of goods and services (accommodation, boards, entertainment, etc…), in line with Candela et al. (2008).

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