An economic model for tourism destinations: product sophistication and price coordination

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Abstract

The paper models the optimal development strategy of a tourism destination by identifying and analyzing two key economic features: i) the long-term choice of whether to invest in the enhancement of natural and/or cultural resources (which act as common goods in the destination) or to increase the degree of sophistication of the tourism product (here intended as the variety of complementary services to accommodation that are demanded by tourists); ii) the short-term choice of whether or not to implement price coordination among local firms, a problem stemming from the anticommon nature of the tourism product. We build a two-stage model for the tourism destination, thus identifying the optimal degree of sophistication of the tourism product and the optimal institutional arrangement in terms of coordination. This approach helps shedding light on the rationale underlying the development path taken by different destinations, thus overcoming some of the limits of the existing literature and providing a simple taxonomy for the observed diversity of real-world destinations. Accordingly, we provide a classification of destinations based on the type of coordination and on whether the primary resource is natural, cultural or organizational.

Keywords: Tourism destination; product variety; natural resources; price coordination; development strategy

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1 Introduction

Research in tourism studies has established the tourism destination (TD) as one of its key concepts, and nowadays many investigations pivot around the organization, the management, the development, and the sustainability of tourism destinations. From the researcher's perspective, the TD embodies all the specific and problematic features of tourism, such as its systemic nature, in which "space" plays a fundamental role (Leiper, 1990). In fact, tourism supply meets demand in the destination; environmental and cultural resources, attractions, the hospitality industry are all located in the destination; tourism demand is revealed in the destination. In other words, the TD is the conceptual link between the complexity of the sector, the complementarities and substitutabilities of the many goods and services composing the tourism product, and the supply of territory. Several different definitions exist for the TD, ranging from management studies, where it is mainly interpreted as a product, to tourism geography where the destination is intended as the offer of territory. In the present paper we consider the destination from the economics perspective, as a kind of (meta) economic agent: a territorial system supplying at least one tourism product able to satisfy the complex needs of tourism demand (Candela & Figini, 2012). The term "tourism product" defines what the common language calls holiday, or what tourism sociology calls the tourist's experience.

But, where is the economics of destinations in the tourism literature? Although its specific features are indeed discussed by others disciplines, such as geography, management, marketing and organizational studies, the study of the TD from the economics perspective is in its infancy, and neither the micro nor the macroeconomic existing literature helps us fully grasp it. Most of the literature, in fact, considers the destination as a mere framework, nothing more than the abstract concept of market, in which to analyze the micro-behavior of specific industries (e.g., the structure of the hotel industry in a specific destination) or tourists (e.g., the determinants of tourism demand in a given destination). Similarly, the macroeconomic literature often identifies the destination with the whole country, in a framework where the economy, in order to attain the maximization of the growth rate, can specialize in tourism and where no attention is paid to what happens within the destination itself. The many theoretical and empirical works testing the validity of the Tourism-Led-Growth hypothesis or testing whether tourism can be considered as an independent factor of economic growth (Lanza & Pigliaru, 1995, 2000; Brau et al., 2007; Sequeira & Macas Nunes, 2008; Figini & Vici, 2010) can be recalled here. Both micro and macroeconomic literatures, however, only scratch the surface of what is the specific and peculiar economic problem of the TD.

The mostly regarded economic model specifically built for the destination is probably the Tourism Area Life-Cycle (TALC) model (Butler, 1980), a well-known application of the product life-cycle theory. Together with Plog (1974) psychographic representation of the interrelation between types of tourists and evolution of the destination, the TALC model is still today the main pillar on which the economic analysis of the TD is based (Butler, 2006). Regardless of its popularity, however, the TALC model has important limitations: firstly, it is a purely descriptive model, with very little explanatory power; secondly, it is a deterministic model, and the TD is bound to pass through the subsequent phases of evolution, the model being unable to fully take into account different trajectories.

Research in tourism economics has only recently been investigating the TD with a closer look, and two interesting strands of literature can be identified. The first one provides a more theoretically sound basis to the TALC model. In particular, Giannoni & Maupertuis (2008) analyze the dynamics between the pattern of investment in tourism infrastructures, policy choices and environmental quality, thereby generating cyclical paths in the number of hosted tourists (from the perspective of consumption waves theory, see also Swann, 2010); similarly, Lozano et al. (2008) build a theoretical model whose dynamics are consistent with TALC; finally, Cerina (2007) investigates the relationship between growth dynamics and environmental sustainability in a model where tourism resources are interpreted as common goods, thus providing a theoretical basis for the concept of sustainable tourism. Nevertheless, all these models share the same caveat: they are mainly macroeconomic growth models where the TD completely overlaps with the economic system (that is, the country is completely specialized in tourism) and where there are no insights on what happens within the TD: in other words the models do not have a micro-foundation.

A second strand of literature tries to take into account specific organizational features and economic characteristics of the destination. In this line of research, the first attempts to build a comprehensive economic model for the TD are Huybers & Bennett (2003), Papatheodorou (2003), Wachsman (2006), Candela et al. (2008), Candela & Figini (2010) and Andergassen & Candela (2012a, 2012b). Within this framework, the present paper argues that the TD has specific and peculiar features which call for a novel and independent economic analysis.

In particular, the economic model for the TD herein developed focuses on two specific aspects of tourism economics that, in our opinion, are not properly addressed by the existing literature: the issue of coordination between local firms and the degree of sophistication of the tourism product. In doing so, we extend and integrate the works of Andergassen & Candela (2012b), who tackle the issue of

sophistication (i.e., the supply of a variety of different local goods and services that are also demanded and purchased by tourists during their stay) and Candela et al. (2008), and Candela & Figini (2010), who address the issue of price coordination. Our approach borrows from Papatheodorou (2003), who firstly formally analyzed the issue of complementarity and variety of services within the tourism product, and from Wachsman (2006), who firstly formally analyzed the problem of price coordination within the destination (see also Alvarez-Albelo and Hernandez-Martin, 2009). The novelty of our paper is twofold. Firstly, we generalize the problem of coordination, tackling the main limitations in the results of Wachsman (2006) and Candela et al. (2008). Secondly, we jointly consider sophistication and coordination, thus building a unique economic model to describe the development and the organizational pattern for the TD. Our approach opens a new window from where to look at the economics of the destination, thus highlighting important policy implications for the destination management and for local stakeholders.

The economic model for the TD developed in this paper stems from two inter-twinned perspectives, empirical and theoretical. From the empirical perspective, our model aims at being consistent with the anecdotal evidence of the great diversity of tourism destinations over the world, which differ in their history, endowment of resources, organizational structure, institutional arrangement and specialization. In this respect, our model is able to depict different trajectories for the TD, hence being able to overcome the deterministic logistic shape of evolution described in the TALC model. Rather, our set-up allows for multiple equilibria. In the same respect, we are also able to explain the reasons why some destinations can be locked-in in a certain phase of development while others jump one or more phases all together. This last problem is key for potential destinations (particularly in developing countries), in which tourism is not (yet) developed, but is seen as an opportunity, being often considered a strategic path for economic development by both policy makers and local stakeholders. As it will be highlighted in the concluding section, our speculative theoretical framework suggests future directions in empirical research, for example testing whether the pattern of coordination and the degree of sophistication in the tourism product are key significant factors in explaining the destination's path of development.

From the theoretical perspective, the destination is a novel and interesting object of study for economics. While some of the specific problems of the TD (the need of supplying public goods and of tackling externalities) are standard market failures which usually call for the intervention of the public sector (although Huybers & Bennet, 2003, show that the public intervention is not necessary if voluntary cooperation among local stakeholders for the management of common resources arises)

there are two specific and peculiar characteristics of the destination that are under-investigated and that are also marginal issues in the standard economic theory.

1. The tourism product supplied and sold by (or within) the destination can be defined as a bundle composed of a set of elementary items. Such goods and services (accommodation, transport, shopping, attractions, events) are demanded in a relationship of complementarity and substitutability by the tourists during the holiday experience. While the concept of bundle is a standard tool in economics (it is commonly used to build price indices to be applied both in theory and in national accounting), what is new in tourism economics is its role as an object of study. The definition of the product as a bundle of complementary and substitutable goods opens the issue of coordination and cooperation among local firms supplying single components of the holiday. In this paper we mainly focus on the complementarity feature, which is particularly relevant for the holiday and allows us to define the tourism product as an anticommon (Michelman, 1982; Heller, 1998; 1999). Accordingly, the holiday can take place if and only if the 'permission to stay' is granted by all firms supplying complementary services to tourists: if just one firm does not grant permission, the tourism activity in the destination can not take place. Stemming from the anticommon nature of the tourism product, the relevant questions to be addressed by an economic model for the destination are: how can the anticommon problem be tackled? Is there any role that can be played by the destination management? What is the optimal pricing policy for the tourism product as a whole? In Section 4 we will present and discuss the answers of our model to these questions.

2. The whole territory (intended as both the endowment of resources and its organizational structure) enters the production function of the holiday as an input; in this respect the destination can be analyzed as a (meta) economic agent taking important decisions from the supply-side at a level which is intermediate to the micro-level (firms and tourists) and to the macro-level (the whole economic system, usually the country). The TD has sometimes been interpreted as a type of cluster (Porter, 1998) since it shares some of the characteristics of the industrial district although it can not be defined as such (Michael, 2003; Candela & Figini, 2012). More specifically, in the industrial district firms either produce substitute goods (horizontal cluster) or intermediate goods which are then assembled (vertical cluster). In the TD, on the contrary, firms mainly produce complementary services that are directly sold to final consumers. Brandeburger and Nalebuff (1997) name this a diagonal cluster, a concept that finds in the TD a

perfect application and that advocates for what they call "co-opetion", that is, the co-existence of competition and cooperation between firms. At the same time, local resources represent the main motivation of the trip, and therefore they also enter the utility function of tourists. Such combination of an item that is at the same time an input of production and an argument of utility provides another novel economic problem to look at. Moreover, most of these resources are freely available (the landscape and the offer of territory in general) and they can be considered as common goods (Hardin, 1968), while other resources can be developed by the destination (e.g., an event or an amusement park). In this respect, the relevant questions to be addressed by an economic model for a destination are: what is the process leading to the rise, the development, the specialization and the sustainability (both environmentally and economically) of the TD? What are the key-factors driving to the development of a tourism product based on natural and/or cultural resources rather than on an institutional arrangement promoting a sophisticated tourism product? In Section 5 we will present and discuss the answers of our model to these questions.

The remainder of the paper is structured as follows: Section 2 introduces and discusses the characteristics of the tourism destination, thus providing the intuition behind the model. Section 3 describes the model's structure and rationale, its assumptions and main limitations. Section 4 focuses on the coordination issue and the optimal institutional set-up for the destination while the main results in terms of resource specialization, variety, and sophistication of the tourism product are described in Section 5. Section 6 discusses the main results and the caveats of the model, thus paving the way for future research, both theoretical and empirical.

2 The Characteristics of the Tourism Destination

From the economics perspective, the TD does not necessarily coincide neither with the destination management organization (DMO), which is one of the possible institutional set-ups that can prevail, nor with the local policy maker. Instead, the destination can be seen as a hypothetical (meta) agent, a territorial system with a specific objective function to maximize and subject to given constraints. In this respect, the economics of destinations studies the relationship between demand (by different types of tourism hosted in the destination) and supply (by the mix of firms located in the territory) for the whole tourism product. In general, a destination may offer different types of holiday to different types

of tourism, each possibly characterized by a different mix of specific goods and services, including the consumption of local resources, and accommodation. Therefore, the tourism product is made up of all the tourism destination specific and non-specific goods and services that are demanded during one day of holiday, its quantity is measured through the number of overnight stays and its value is the daily price of the holiday. In the case of multi-tourism destinations, the whole tourism product can hence be interpreted as the weighted average of the many types of holiday offered in the destination. Note that in the present context, where the demand function is known with certainty, choosing the daily price (which coincides with the weighted average price of the holiday) is equivalent to choosing tourism expenditure (i.e., the holiday's aggregate price). It is well known that many conceptions of value exist, being particularly relevant in tourism where many non-market or semi-market goods (such as environmental and cultural resources) are demanded and used. As it is typical in the economic approach, we only focus on the market value of the holiday, as determined by its price, and we abstract from any implication regarding the social and cultural value of tourism in the destination. Nevertheless, we capture indirectly cultural and environmental values of the destination's resources through price and demand effects, as in our model consumer demand changes with the perception of environmental quality.

Contrary to what can be done in applied research, in a theoretical model we have to rely on strong assumptions, less descriptive of the real-world complexity of destinations but able to unfold the core of the economic problem faced by the TD. We start by identifying two necessary conditions for the birth of a tourism destination, and one necessary condition for its long-term sustainability (Andergassen & Candela, 2012b).

Firstly, a generic point of interest, natural or artificial, must exist in order for the destination to come into being. In order to keep the model as simple as possible, while maintaining its explanatory power, local tourism resources are measured through a quantitative index R, which summarizes the overall endowment of the destination (its natural, cultural and organizational resources, the accessibility of its transport system, its infrastructures, etc.). R depends on both exogenous (the endowment provided by nature, history and culture) and endogenous factors (the investment undertaken by the local community - public and private sectors - to adapt the endowment in order to be successfully included in the tourism product, to preserve it, and to enhance it: for example by building amusement parks or conference venues, by organizing events, etc.). In short, any destination can be identified by its endowment of resources, the only constraint being that $R > 0$. Given a certain quantity R, its

quality as perceived by tourists, that we call z, depends (non-positively) on the number of overnight stays, hence roughly accounting for and measuring crowding and congestions effects. The sign of the relationship between the parameter z and overnight stays is a matter of discussion, and we should also consider the different case of a positive or, more in general, a non-linear relationship. In this paper we assume that a threshold in the number of overnight stays exists, after which congestions effects are at play.

Secondly, at least one variety of local goods has to be supplied together with hospitality and the local resource, otherwise the visit to the destination is not motivated. We measure the variety of the tourism product through n, the number of differentiated tourism goods and services that compose the tourism bundle; each good/service is represented by the index $i = 1, ..., n$. The straightforward interpretation is that the higher the number $n \geq 1$, the greater the level of sophistication (the variety) of the tourism product; at the limit, $n = 1$ when only the basic service needed to access the main resource is provided in the destination.

For the sake of simplicity, we assume that there are only two firms in the destination, one hospitality firm, supplying the accommodation service and the other one producing all the differentiated goods/services. The assumption of having only one firm supplying all the differentiated tourism goods/services greatly simplifies the exposition without altering the qualitative features of the results (in footnote 2 we discuss how results change if this assumption is relaxed).

We consider identical tourists endowed with a CES (Constant Elasticity of Substitution) utility function, following a long strand of literature on product differentiation which dates back to the seminal paper of Dixit & Stiglitz (1977) and that has already been applied to tourism by Papatheodorou (2003). Hence, from the demand side, we consider the choice problem of a consumer who has to decide how to allocate a given income among a set of generic consumption goods (y) and a tourism product (T), a bundle in which the local resource R is measured through its overall quality (z), hospitality (h) and a variety of goods and services (x_i).

Moreover, the supply of different varieties i of the local good x_i and the complementary hospitality service h need to coordinate in their quantity, quality and price, otherwise a suitable product able to meet the tourism demand can not be supplied. For the sake of simplicity we only consider coordination in price (assuming that both coordination in quantity and in quality are already in place, see Wachsman, 2006; Candela & Figini, 2010) between the only hospitality firm in the destination and the firm supplying differentiated tourism related goods and services.

The above mentioned conditions are however not sufficient to guarantee the survival of the destination in the long-term. In fact, long-term economic sustainability can be achieved only if overall tourism profits of the destination, Ω, net of the costs K borne by the destination for the investment undertaken to promote and foster the local tourism sector, are at least as large as Ω^*, which is an exogenously defined threshold that guarantees the long-term survival of the destination. This is the static equivalent of the dynamic principle that, in terms of endogenous growth theory, the growth rate attained through specialization in the tourism activity must be at least as large as the one obtainable if the destination specializes in alternative activities (Lanza & Pigliaru, 1995; 2000). Concerning the market structure of the destination, we assume that both firms are monopolists. This can stem from the fact that the destination operates in a monopolistic competition regime because of the peculiarity of its local endowment R thus translating into the market power of its hospitality firm (sector) and of the firm producing differentiated tourism goods x_i, since these goods are linked to the local resource and their characteristics differ across varieties (Candela et al., 2009). We acknowledge that in reality there are many firms that are aware of their market power and therefore strategically interact with each other. Consequently, oligopolistic competition would be a more appropriate setting for the analysis, but we leave this issue for possible future research.

This modeling set up will allow us to identify the conditions under which a region can successfully develop into a tourism destination, either by following a policy of enhancement of its resources R, by directly or indirectly influencing the degree of sophistication n, or by selecting a strategic coordination of prices (p_i, $i = 1, ..., n$ and p_h) between the producer of local goods and the hospitality sector. Thus, the implications for tourism policy can be investigated, providing answers to the many (perhaps too many) hopes of policy makers and local stakeholders who see tourism as the key strategic sector for the economic take-off of their region. On this aspect, two positions can be recalled. For someone (Raffestin, 1986), tourism is like the Peano's curve, that in the theory of fractals is a space-filling curve; hence every territory can become a tourism destination. For others, regardless of the investment in resource enhancement, in artificial endowment or in the variety of local goods, tourism development is only triggered by the existence of an exogenous endowment and by the structure of preferences of the consumers: without such prerequisites and conditions on the demand, the territory would never be able to reach the threshold Ω^* necessary to become a sustainable tourism destination.

3 The model

To more precisely investigate the complex process leading to the rise and development of the TD intuitevely described in the previous section, we now develop a formal model. We identify a multi-stage problem, whose decision tree is shown in Figure 1. Firstly, the local community has to decide whether to develop a tourism destination or invest in other economic activities, the former strategy being chosen if the net economic return to the investment is at least as large as its opportunity cost, $\Omega - K \geq \Omega^*$, where Ω^* is the destination's outside option. If this inequality holds, the optimal amount of local resources (here intended as common goods), hospitality and variety of the local goods is determined.

[Insert Figure 1 about here]

In the following stage of the problem, the issue of whether the tourism activity in the local territory should be coordinated or not is tackled. In this phase, the equilibrium prices for goods and services included in the tourism product (here intended as an anticommon) are computed. The decision on whether or not to coordinate depends on the sign of $\Omega^C - \Omega^{NC}$, where Ω^C and Ω^{NC} are overall tourism profits of the destination with and without price coordination. In the case of coordination, there are two possibile solutions: coordination provided by the destination management, in which total profits are Ω^{DM}, and coordination provided by a tour operator, in which total profits are Ω^{TO} (see Figure 1). Moreover, from the destination's perspective it is also important to distinguish between local and foreign tour operators, since in the latter case the tour operator's profits are exported and then leave the local economy. Although we argue that the solution with the local tour operator dominates the one with a foreign tour operator in terms of total local profits, this strategy is not always feasible, particularly for developing countries (in many destinations, the necessary professional skills and competencies might lack, or the local tour operator might have higher production costs stemming from information asymmetry or weaker economies of scale and of scope): hence it is represented as a dotted line in the decision tree of Figure 1.

An important assumption of the model is that production costs of the two local firms are nil (taking positive average production costs into account would not alter the qualitative features but only complicate the exposition of our results) and consequently tourism profits coincide with revenues, and hence with total expenditure of tourists in the destination. This has an interesting implication,

since it allows us to reconcile the target of profit maximization, which is standard for economic theory, with the one of maximization of tourism expenditure, the usual target for local tourism policy. Hence, the model can correctly describe the real-world practice of looking at overall tourism expenditure as the main indicator of tourism performance for the destination.

We first describe the demand side of the model. Since overall tourism profits (Ω) are equal to tourism expenditure, which is directly linked to the number of overnight stays, they in turn depend on the characteristics of the local tourism product. We follow Papatheodorou (2003) and Andergassen & Candela (2012b) by assuming that tourists' demand depends on: i) the availability of natural and/or cultural resources (see also Melian-Gonzalez & Garcia-Falcon, 2003); ii) the availability of a variety of local goods and services, such as restaurants, recreational activities, wellness and sport facilities, etc., that justify tourism in the destination, beyond the enjoyment of the main resource. In this respect, we assume that tourists show "love for variety" in the tourism product, as defined by Dixit & Stiglitz (1977).

We consider a unit mass of identical tourists endowed with a CES utility function having the following arguments: i) the length of stay h of the holiday at the destination; ii) a variety of $n \geq 1$ differentiated tourism related goods and services x_i offered at the destination, with $i = 1, 2, ..., n$; iii) an index measuring the perceived quality z of the destination's resource endowment R; iv) the consumption of a non tourism product y (which can also be thought as the holiday in an alternative destination). The tourism product is defined by a bundle T including overnight stays and the whole variety of local goods, $T = (h, \{x_i\})$.

If we name with $U_{T,j}$ the sub-utility of the consumer j as a tourist and with $U_{Y,j}$ the sub-utility stemming from non-tourism consumption, total utility for the agent is $U_j = U(y(j), z(j), h(j), x_i(j))$ and can be written through a compound CES utility function (3) (compound CES utility functions have been employed in the context of industrial organization and of tourism economics by Jiandong (2003) and Andergassen & Candela (2012a, 2012b), respectively):

$$U_{T,j} = z\left[h^{\gamma}(j) + \left(\sum_{i=1}^{n} x_i^{\alpha}(j)\right)^{\frac{\gamma}{\alpha}}\right]^{\frac{1}{\gamma}} \tag{1}$$

$$U_{Y,j} = y(j) \tag{2}$$

$$U_j = \left(U_{Y,j}^{\beta} + U_{T,j}^{\beta}\right)^{\frac{1}{\beta}} = \left\{ y^{\beta}(j) + z^{\beta} \left[h^{\gamma}(j) + \left(\sum_{i=1}^{n} x_i^{\alpha}(j) \right)^{\frac{\gamma}{\alpha}} \right]^{\frac{\beta}{\gamma}} \right\}^{\frac{1}{\beta}} \tag{3}$$

In such model, $0 < \beta < 1$ implies that the non-tourism good y and the tourism product T are gross substitutes (if $\beta = 1$, the two goods are perfect substitutes); $\gamma < 1$ implies that overnight stays h and the consumption of local goods x_i are gross complements (if $\gamma \to \infty$ the two goods are perfect complements). We also assume that $\beta \leq \alpha < 1$, that is, the degree of substitutability between the tourism product T and the non-tourism product Y is not greater than the degree of substitutability among local tourism goods and services x_i. Finally, z indicates the perceived quality of the tourism resource, such as beaches, mountains and/or the cultural heritage of the destination. The resource quality z has the O-ring property, that is, it enters the utility function (1) as a multiplicative factor since tourism exists if and only if $z > 0$.

The price of the non-tourism good is taken as a numeraire, $p_y \equiv 1$, p_h is the price of the overnight accommodation in the hotel, p_i is the price of the i-th variety of the local good. The budget constraint of tourist j is hence:

$$y(j) + p_h h(j) + \sum_{i=1}^{n} p_i x_i(j) = I \tag{4}$$

where I is the tourist's overall income, which is exogenous to our analysis since tourists, by definition, are non-residents. The tourism resource R, generally understood as the whole endowment of the territory, is considered as a public good of the destination and therefore does not appear in the budget constraint (4) (see Papatheodorou, 2003; this assumption, however, does not hold if the main resource of the destination is very specific and therefore semi-private, such as an amusement park or a specific museum.).

We assume that the perceived quality of the resource, z, depends positively on its quantity R, $z_R > 0$, but with non-increasing returns, $z_{RR} \leq 0$, and non-positively on H, the total number of overnight stays in the destination, since the level of satisfaction the tourist gets from visiting the resource is inversely linked to the crowding of the site, $z_H \leq 0$ with with $z_{HH} \leq 0$ and $z_{HR} \geq 0$. In particular, we assume that z is a continuous function of H and that a threshold $\overline{H}$ for aggregate overnight stays exists where $z_H = 0$ for $H \leq \overline{H}$ and $z_H > 0$ for $H > \overline{H}$. With this assumption we aim to model the case where aggregate overnight stays reduce tourism quality if they exceed the threshold $\overline{H}$ (we thank an anonymous referee for suggesting this functional form). Let the elasticity of z with respect to H be $\varepsilon_H^z = \frac{\partial z}{\partial H}\frac{H}{z} \leq 0$, where $\varepsilon_H^z = 0$ for $H \leq \overline{H}$ and $\varepsilon_H^z > 0$ for $H > \overline{H}$.

We first derive the individual demand function for accommodation and for the differentiated goods and services, and then calculate aggregate demand functions. Given the symmetry on the supply side of tourism products x_i (by assumption average production costs of goods and services are all nil), we have that $p_i = p$ for all $i = 1, ..., n$. Since the mass of tourists is normalized to one, aggregate demand functions H, X_i and Y are simply the sum of the tourist's individual demand functions $h(j)$, $x_i(j)$ and $y(j)$, for individuals $j \in [0,1]$. More formally, $H = \int_0^1 h(j)\,dj$, $X_i = \int_0^1 x_i(j)\,dj$ and $Y = \int_0^1 y(j)\,dj$, where H represents total overnight stays in the destination, X_i total consumption of the complementary local good i and Y total consumption of other goods. We consider parameter values such that at the equilibrium the price of overnight stays is larger than the price of differentiated tourism goods and services, i.e. $p_h > p$. Note that the single tourist is small compared with the overall mass of tourists in the destination and therefore, for his consumption decisions, he takes the perceived tourism quality as given. At the aggregate level, the individuals' choices feed back into tourism quality which in turn affects the individual, and consequently also aggregate, consumption behavior. In other words, a fixed point problem has to be solved.

The following properties of aggregate demand functions can be established.

Lemma 1 *The aggregate demand function for overnight stays in the destination is $H^*(n, R, p, p_h)$, where H^* is increasing in n, and R and decreasing in p_h and p; the aggregate demand function for the single tourism good is $X^*(n, R, p, p_h)$, where X^* is decreasing in n, increasing in R and decreasing in p and p_h.*

Proof. The proof can be found in the Appendix. ■

Because of the complementarity between overnight stays and tourism related goods and services, an increase in n leads to an increase in the demand of overnight stays. On the other hand, an increase in n reduces the demand of each single tourism good X^*. An increase in R, by fuelling tourism quality, increases the demand of overnight stays H^* and the demand of tourism goods X. Changes in prices have the standard effect on demand: the law of demand holds; assuming that the elasticity of z with respect to H^* is in absolute values not too large,[1] the complementarity between $\{x_i\}$ and h implies that an increase in p (p_h) decreases demand of H^* (X^*).

[1] An increase in p unambiguously reduces H^*. An increase in p_h has, because of the complementarity between $\{x_i\}$ and h, a direct negative impact on X^*, but a indirect positive one, since it reduces H^* and therefore increases tourism quality z. If $\left|\varepsilon_H^z\right|$ is not too large, then the former effect dominates the latter one. A formal proof of this result can be obtained upon request from the authors.

Given that production costs are nil, profits of the hospitality sector are $\Pi_h(n, R, p, p_h) = p_h H^*(n, R, p, p_h)$ and those of the firm producing the differentiated goods and services are $n\Pi(n, R, p, p_h)$, where $\Pi(n, R, p, p_h) = pX^*(n, R, p, p_h)$. Overall tourism profits for the destination are

$$\Omega(n, R, p, p_h) = n\Pi(n, R, p, p_h) + \Pi_h(n, R, p, p_h).$$

4 The Coordination between Firms in the Destination and the Optimal Pricing Strategy

Like all multi-stage problems, the model has to be solved backwards, and the equilibrium prices of the different coordination alternatives (second stage of the problem) have to be determined in order to get the optimal endowment of local resources and sophistication of the tourism product (the solution of the first stage problem). In this section we solve the second stage of the problem by moving to the supply-side and assuming that firms and destinations are price-makers. This last hypothesis is coherent with real-world tourism markets, which are often non-competitive markets either because firms have monopoly or oligopoly positions or, as it is the case for destinations, because of the high degree of differentiation of the tourism product at the global level (Candela et al., 2009). Hence, for a given choice of n and R, we investigate the characteristics of optimal pricing strategies for the TD.

The daily price of the holiday in the destination, v, is:

$$v = p_h + np\frac{X^*}{H^*} \tag{5}$$

consisting of the price for accommodation services and the price of differentiated tourism goods/services times the quantity demanded per day ($\frac{nX^*}{H^*}$). The equilibrium quantity for the tourism product is identified by the number of days spent at the destination (the number of overnight stays, H^*). As already recalled, in this set-up tourism in the destination can be interpreted as a 'permission to stay' granted by the firms supplying complementary services demanded by tourists while on holiday: if one of the two firms does not grant permission, the tourism activity can not take place. For instance, tourism demand would be nil if restaurants were not available in the destination, or if no accommodation was present. The catchy idea regarding the existence of a unique economic good, whose property is fragmented across different firms, is known as "anticommon" and is not new in Economics (see

Michelman, 1982; Heller, 1998; 1999; Parisi et al., 2000; 2004) although the concept has not been sufficiently exploited so far, particularly in the field of tourism economics where it nevertheless finds a perfect application (Candela et al., 2008). Note that the anticommon is exactly the opposite of the much better known "common", a good which is available to everyone and without well defined property rights (Hardin, 1968).

In a general perspective, firms in the destination have to coordinate in quality (in order to avoid, for example, that tourists hosted in a luxury hotel only find take-away restaurants) and in quantity (to guarantee that there is no rationing in any of the demanded services). However, in this paper we neglect these issues and we only focus on price coordination. We introduce three different cases: (a) no coordination, where each firm maximizes its profits; (b) price coordination by means of a destination management and (c) coordination provided by a tour operator supplying an all-inclusive holiday.

4.1 No Coordination

Without coordination, firms solve independent maximization problems. In particular the maximization problem for the hospitality firm is $max_{p_h} \Pi_h$. First order condition for this problem is

$$\frac{\partial \Pi_h}{\partial p_h} = H^* + p_h \frac{\partial H^*}{\partial p_h} = 0 \tag{6}$$

The firm producing differentiated goods and services faces the maximization problem $max_p n\Pi$. First order condition for this problem is

$$\frac{\partial n\Pi}{\partial p} = nX^* + pn\frac{\partial X^*}{\partial p} = 0 \tag{7}$$

By considering the first order conditions (6) and (7), and assuming that second order conditions are satisfied, we obtain a system whose solution (defining a Nash equilibrium that exists if the two functions intersect in the first quadrant, see also Wachsman, 2006) implicitly defines the optimal values of p_h and p:

$$\begin{gathered} g_h\left(n, R, p, p_h\right) = 0 \\ g\left(n, R, p, p_h\right) = 0 \end{gathered} \tag{8}$$

For each R and n, optimal prices for the destination can be expressed as $p_h^{NC} = \phi_h^{NC}\left(n, R\right)$ and $p = \phi^{NC}\left(n, R\right)$, firm profits are $\Pi_h^{NC}\left(n, R\right)$ and $n\Pi^{NC}\left(n, R\right)$, and total tourism profits for the destination

are $\Omega^{NC}(n,R) = \Pi_h^{NC}(n,R) + n\Pi^{NC}(n,R)$.

4.2 Coordination provided by the destination management

This type of coordination, external to the market, takes place if the hotel and the local firm support the role and back the activity of a public authority, named destination management. Then, we assume that this local authority is able to coordinate the local tourism sector through informational and promotional activity and to sell the tourism experience in the destination (local goods and hospitality) as if it were an all-inclusive package. Formally, the analytical problem becomes the maximization of overall tourism profits (tourism expenditure) in the destination:

$$max_{p,p_h} vH = \Omega(n,R,p,p_h)$$

where v is the daily price of the holiday in the destination (5). Assuming that the second order conditions are satisfied, the first order conditions for this problem are

$$\begin{array}{l} \frac{\partial \Omega}{\partial p_h} = H + p_h \frac{\partial H}{\partial p_h} + np\frac{\partial X}{\partial p_h} = g_h(n,R,p,p_h) + np\frac{\partial X}{\partial p_h} = 0 \\ \frac{\partial \Omega}{\partial p} = p_h \frac{\partial H}{\partial p} + nX + np\frac{\partial X}{\partial p} = g(n,R,p,p_h) + p_h\frac{\partial H}{\partial p} = 0 \end{array} \tag{9}$$

from which we get for each R and n the optimal price for the destination $p_h^{DM} = \phi_h(n,R)$ and $p^{DM} = \phi(n,R)$, firm profits $\Pi_h^{DM}(n,R)$ and $n\Pi^{DM}(n,R)$, and total tourism profits $\Omega^{DM}(n,R) = \Pi_h^{DM}(n,R) + n\Pi^{DM}(n,R)$.

By comparing system (8) and (9) and because of Lemma 1 the following Proposition holds.

Proposition 1 *$p_h^{DM} < p_h^{NC}$ and $p^{DM} < p^{NC}$ and $\Omega^{DM} > \Omega^{NC}$.*

Proof. The result follows from the second order conditions of the problem and the comparison of system (8) and (9). In particular, suppose that $p = p^{NC}$ and $p_h = p_h^{NC}$, then from (9) and Lemma 1 $\frac{\partial \Omega}{\partial p_h} = np\frac{\partial X}{\partial p_h} < 0$ and $\frac{\partial \Omega}{\partial p} = p_h\frac{\partial H}{\partial p} < 0$, and consequently, because of concavity of Ω, p_h and p are too large. ■

The intuition behind this result is that when goods are complements, their prices are too high when they are individually set, since firms are not able to internalize the negative effects a price increase has on the other firm's demand and thus profits. Alternatively, the coordination of prices provided by the destination management allows to set a more efficient daily price for the tourism product, thus

leading to an increase in overall tourism expenditure even though individual prices are lower. However, profits for one of the two firms could be lower when price coordination is in place, if the externality is strongly asymmetric (that is, the price of one good affects strongly the demand of the other one but not the other way around). For instance, consider the case where the price of overnight stays has a strong negative impact on the demand of differentiated tourism goods and services, and that the effect of a change in the price of these latter on the demand of overnight stays is negligible. The destination management would in this case internalize this negative externality and thus fix a lower price for overnight stays, while keeping the same price for tourism goods. As a consequence, profits of the hospitality service are lower, profits of the firm producing differentiated tourism goods are larger and overall tourism profits are larger compared with the case of no price coordination. In this case the destination management should also redistribute profits among its members. Note that Proposition 1 holds for a generic demand function as long as $\frac{\partial X}{\partial p_h} < 0$ and $\frac{\partial H}{\partial p} < 0$ and second order conditions are satisfied.

4.3 Coordination Provided by a Tour Operator

Coordination can also occur endogenously when the market itself identifies a new type of firm for managing the anticommon problem. Such firm, which is known as the tour operator in the business practice, stipulates contracts with hotels and local firms by anticipating a payment that covers the market risk: the premium paid by firms for this insurance activity is the discount granted on the full market price (Castellani & Mussoni, 2007). The tour operator then promotes and sells the services within an all-inclusive holiday package, thus bearing the risk of no sale.

The contract is accepted by the hotel and by the firm selling the differentiated goods if, despite the discount, their profits increase (or at least do not decrease) with respect to the case of no coordination. Let us assume that the tour operator offers a free-sale contract in order to buy services from local firms in which the discounted price is $p_h - d_h$ for the overnight stay and $p - d$ for each differentiated good, and where d_h and d are respectively the two discounts (to be interpreted as the insurance premium). The economic goal of the tour operator is to maximize its own profits Π^{TO} (again, we assume for the sake of simplicity that the tour operator average costs are nil) subject to the participation constraint of the local firms: they accept the contract rather than selling directly on the market if and only if their profits are at least as large as the profits they get without coordination. Such optimization problem (for a different interpretation of the tour operator's activity in the coordination problem, see

Alvarez-Albelo & Hernandez-Martin, 2009), in a principal-agent setting is hence:

$$max_{p_h,p}\Pi^{TO} = p_h H + npX - (p_h - d_h)\, H - n\,(p - d)\, X \tag{10}$$

$$\text{s.t.} \;\; (p_h - d_h)\, H \geq \Pi_h^{NC} \text{ and } \; (p - d)\, X \geq \Pi^{NC} \tag{11}$$

(11) are the participation constraints, where Π_h^{NC} and Π^{NC} are the firms' profits obtained in Section 4.1 and constitute their outside options of not accepting the tour operator's contract. If we assume that the tour operator (the principal) offers to local firms (the agents) the minimum revenues of acceptance (which transforms inequalities (11) into equalities, thus determining d and d_h) and by replacing the binding participation constraints (11) into the tour operator's objective function (10) we obtain

$$max_{p,p_h}\Pi^{TO} = p_h H + npX - \Pi_h^{NC} - n\Pi^{NC} \tag{12}$$

It is easy to verify that the first order conditions of (12) are the same as those in (9) and thus optimal prices are $p_h = p_h^{TO}$ and $p = p^{TO}$, which are identical to those of the destination management.

4.4 Discussion

By comparing the solution of no coordination with those in the case of exogenous coordination through the destination management and endogenous coordination through the tour operator, we can state the following theorem.

Theorem 1 (The Coordination Theorem) *Given the anticommon property of the tourism product, coordination among firms in the destination, which can either be provided by the destination management or by a tour operator, increases tourism profits.*

Hence, the coordination of prices allows the tourism activity in the destination to be more efficient.[2] Note that this is an example of the prisoner dilemma where (price) coordination yields a Pareto superior solution to non-coordination.

[2]If we assume that differentiated tourism goods and services are supplied by more than one firm, each with some market power, then in addition to the problem that stems from the complementarity relation between accommodation and differentiated tourism goods described above we have an additional problem stemming from the substitutability between the single differentiated goods/services, where it is well known that firms charge lower than socially optimal prices. In this case firms do not internalize the positive external effect that a price increase produces on the demand for another product. Thus, by considering together the complementarity and the substitutability problem, a more general coordination theorem still holds where exogenously or endogenously both negative (due to the complementarity) and positive (due to the substitutability) externalities are internalized.

In case of coordination provided by the market as described in Section 4.3, however, there is a distributional conflict between the tour operator and local firms. Independently of the way in which the distribution is solved (which depends on the bargaining power of local firms, the tour operator and, in a more general setting, on the number of tour operators competing for the destination, see Alvarez-Albelo and Hernandez-Martin, 2009), it is crucial to evaluate whether or not the tour operator is a local or a foreign firm. In fact, if the tour operator is a local firm, total tourism profits are the same as is in the case of coordination by destination management, although the distribution of the overall profits among local firms changes. More formally, total profits in the presence of a tour operator are $\Omega^{TO} = \Pi^{TO} + \Pi_h^{NC} + n\Pi^{NC}$, and thus it is easy to see that $\Omega^{TO} = \Omega^{DM}$. On the contrary, if the tour operator is a foreign firm, its profits do not contribute to the destination's income and thus total tourism profits of the destination are $\Omega^{TO} = \Pi_h^{NC} + n\Pi^{NC}$, and thus $\Omega^{TO} = \Omega^{NC} < \Omega^{DM}$, the difference $\Omega^{DM} - \Omega^{NC}$ being the surplus generated by the price coordination and forming the tour operator's profits. It is then possible to state a corollary of the Coordination Theorem by focusing on the distributional consequences of endogenous coordination.

Corollary 1 *When coordination is provided by a foreign tour operator, local profits are lower than in the case of coordination provided by the destination management. The type of coordination chosen in the destination is therefore not distribution neutral.*

Clearly, the solution of a local tour operator dominates a foreign one's (since in the former case the tour operator's profits remain in the local economy), but it is fundamental to recall that this corollary stems from the assumption of identical cost structure for both tour operators, and thus in a more general setting, it may not hold. It is likely that for many destinations, particularly in developing countries, the local tour operator might lack the skills or the market conditions to produce at such a (low) cost. To simplify the exposition, in the remaining part of the paper we focus solely on the case of a local tour operator.

5 The Optimal Level of Sophistication of the Tourism Product in the Destination

In this section we now move to the first stage problem where the TD has to find the optimal pattern of development, given the price solutions for the coordination problem defined in Section 4. We argue

that, following a long-run strategy of development, the local policy maker can engage in investments that enrich the destination's natural as well as cultural resource endowments R. Moreover, we argue that it can directly or indirectly control the degree of sophistication of the tourism product n. This is done, for example, through either granting licenses to open shops or other business activities or, in a more microfounded model, through the taxing or subsidizing of the setup cost for single production/commercial facilities. In a full-fledged model one should firstly calculate the optimal private degree of product differentiation, secondly calculate the optimal social one, and thirdly find the optimal policy intervention such that the private one coincides with the social one (however, this is beyond the scope of the paper). More formally, the TD faces the following maximization problem

$$max_{n,R}\Omega\left(n, R, p^C, p_h^C\right) - K\left(n, R\right) \tag{13}$$

$$\text{s.t. } \Omega - K \geq \Omega^* \tag{14}$$

where $K\left(n, R\right)$ are the policy maker's cost of enforcing a degree of sophistication n and endowing the destination with resources R, where $\frac{\partial K}{\partial n} > 0$, $\frac{\partial K}{\partial R} > 0$, $\frac{\partial^2 K}{\partial n^2} > 0$ and $\frac{\partial^2 K}{\partial R^2} > 0$. A change in n and R affects tourism profits directly and indirectly through a change in p and p_h; since the solution at the second stage is either exogenous or endogenous price coordination with equilibrium prices $\left(p^C = p^{TO} = p^{DM}; p_h^C = p_h^{TO} = p_h^{DM}\right)$, the indirect effect is of second order and can thus be neglected because of the envelop theorem. Formally, the total derivative of tourism profits with respect to n is

$$\frac{d\Omega}{dn} = \frac{\partial \Omega}{\partial n} + \frac{\partial \Omega}{\partial p^C}\frac{\partial p^C}{\partial n} + \frac{\partial \Omega}{\partial p_h^C}\frac{\partial p_h^C}{\partial n} \tag{15}$$

where the first term is the direct effect of n on Ω and the last two terms are the indirect effects through p^C and p_h^C, respectively. Because of the first order condition (9) the indirect effects are negligible, i.e. $\frac{\partial \Omega}{\partial p^C} = 0$ and $\frac{\partial \Omega}{\partial p^C} = 0$, and thus only the direct effect matters, i.e. $\frac{d\Omega}{dn} = \frac{\partial \Omega}{\partial n}$. The case of a change in R gives symmetric results. Finally, (14) is a sustainable development constraint requiring that tourism profits must be sufficiently large to guarantee the survival of the destination over time.

Before characterizing the solution to problem (13), we describe the analytical properties of Ω, which is a special case of the results in Andergassen and Candela (2012b).

Proposition 2 *(a) Ω is increasing in R. (b) Ω is decreasing in the degree of tourism sophistication n if $\varepsilon_H^z \lambda_\gamma > 1$ and is increasing if $\varepsilon_H^z \lambda_\gamma < 1$, where $\lambda_\gamma \equiv \frac{\gamma}{1-\gamma} \in (-1, 0)$.*

Proof. See the Appendix. ■

An increase in the destination's resource endowment increases the demand for overnight stays as well as the demand for tourism related goods and services and thus overall tourism profits increase. Differently, an increase in the degree of sophistication of the tourism product has an ambiguous effect on tourism profits, depending on the degree of complementarity between overnight stays and tourism goods as well as on the elasticity of tourism quality with respect to the size of the tourism activity. To understand the intuition behind this result we have to disentangle the effects of two opposing forces that are at play: a love of variety effect and a tourism depreciation effect. If overnight stays and tourism goods are independent (that is, for $\lambda_\gamma \to 0$), then an increase in n does not affect overnight stays H. Consequently, the tourism quality does not decrease and thus the only effect is that tourists spend more because of their love for variety preferences. Hence, tourism profits increase. In a similar vein, tourism profits increase unambiguously if overnight stays and tourism goods are complements, where an increase in n increases overnight stays H, and the perceived tourism quality does not decrease as H increases (i.e. for $H \leq \overline{H}$ where $z_H = 0$). On the other hand, if $z_H < 0$ (that is, if $H > \overline{H}$), then an increase in H reduces tourism quality, thereby reducing tourists' expenditure on the overall tourism product. If the reduction in tourism quality is sufficiently strong (that is, $|\varepsilon^z_H| > \frac{1}{|\lambda_\gamma|}$) then this latter effect more than offsets the love for variety effect and thus overall tourism expenditure, that is, overall tourism profits, decrease. On the other hand, if the reduction in tourism quality is sufficiently weak (that is, $|\varepsilon^z_H| < \frac{1}{|\lambda_\gamma|}$), then an increase in the degree of sophistication increases tourism profits.

Assuming that parameters are such that for some values of n, $\Omega_n > 0$ (if on the contrary $\Omega_n < 0$ for all $n \geq 1$, then tourism development through sophistication is not viable) the marginal rate of substitution between R and n provides a theoretical answer to the question about the conditions driving the birth, the development pattern and the sustainability of the tourism destination. In fact, the optimal degree of investment in specialization (through enhancement of resources or sophistication) of the tourism destination is given by the maximization of tourism profits. The first order conditions of the maximization problem (13) are

$$\frac{\partial \Omega}{\partial R} = \frac{\partial K}{\partial R} \text{ and } \frac{\partial \Omega}{\partial n} = \frac{\partial K}{\partial n}$$

and describe the optimal policy mix of the destination, determined with respect to the relative marginal gain (the marginal rate of substitution between R and n is $MRS_{R,n} = -\frac{\Omega_R}{\Omega_n}$) and to the relative marginal costs of local investment, respectively in R and n ($MRS_{R,n} = -\frac{K_R}{K_n}$). Moreover, by means of

technical progress, the elasticity ε_H^z affecting the properties of Ω described in Lemma 2 might change. The interpretation would be that the tourism sector moves away from being a low technology sector, thus increasing the options to preserve, restore and re-qualify its resources.

If the negative tourism quality effect always dominates the positive love for variety effect (i.e. $\varepsilon_H^z \lambda_\gamma > 1$ for each $n \geq 1$ and $R > 0$), then development of the destination through tourism sophistication is not feasible and can thus only occur through resource investments. Resource investment may pave the way for tourism sophistication to become a viable development strategy if it alleviates the negative tourism quality effect (formally, if $\frac{\partial}{\partial R}\varepsilon_H^z < 0$) and thus the destination can twin resource investments with tourism sophistication to foster tourism activity.

The different solutions allow to recognize different organizational and development patterns for real-world destinations. For example, if we narrow the analysis only to beach tourism in Italy, there are destinations with limited resources but a very high degree of sophistication of the tourism product (for example Rimini); there are destinations with extraordinary natural resources and no sophistication at all, with local supply limited to hospitality (for example some coastal areas of Sardinia); there are destinations with important natural resources and a certain degree of variety of local products (for example the Costa Smeralda). Theoretically and politically, this has important implications: according to the TALC model, in fact, those three different types of destination are at different stages of their evolution, while in the present model they are different optimal equilibria stemming from alternative endowments of resources and specialization patterns.

Moreover, to complete the description of the solution to problem (13), we need to discuss the relevance of the sustainable development constraint (14): $\Omega(n^*, R^*) - K(n^*, R^*) \geq \Omega^*$. If this condition holds we can affirm that tourism development is viable and sustainable. If instead $\Omega(n^*, R^*) - K(n^*, R^*) < \Omega^*$, then tourism profits are below the minimum threshold and the solution for the territory willing to become a destination is not economically viable.

From a policy perspective, the implication of this section of the model is that the destination management can trigger tourism development in two alternative ways: either by investing in the enhancement, preservation and improvement of existing resources, or by supporting the increase in the variety of local tourism goods and services, that is what we call "degree of sophistication of the tourism product". While the former strategy is usually bounded by the exogenous endowment of historical sites, cultural heritage and natural environment, the latter strategy can be implemented through the interaction between the private and the public sector and has the advantage of fueling forward and

backward linkages among tourism firms and between tourism firms and other sectors. Finally, it is remarkable to note that the increase in the degree of sophistication of the tourism product has a double effect on total expenditure: on the one hand, it positively affects profits through the increase in the total number of overnight stays; on the other hand, it negatively affects it through a perceived worsening of quality due to congestion and crowding effects. As a particular case, if the destination's development level is such that it does not bear congestion effects, i.e. $H < \overline{H}$ where $\varepsilon_H^z = 0$, or if this effect is very small, i.e. $|\varepsilon_H^z| < \frac{1}{|\lambda_\gamma|}$, these properties define a "Love for Variety Theorem" for the destination allowing for a tourism "take-off" in the long run. The variety in the tourism product can then be a strategic asset.

Theorem 2 (Love for Variety Theorem) *As long as the negative externalities on tourism quality are small, the reorganization of the tourism destination towards increasing the variety of available goods and services raises tourists' welfare and their willingness to spend on tourism at the expense of non-tourism consumption, thereby stimulating the economic development of the destination.*

Conclusions

In this paper we developed an economic model for the tourism destination, by focussing on two specific aspects that, in our opinion, can not be properly studied with the standard toolbox of micro and macroeconomic theory and for which the destination is an interesting object of study from the economics perspective: i) the tourism product can be defined as a bundle composed of a set of elementary items. Such goods and services (accommodation, transport, shopping, attractions, events, etc.) are mainly demanded in a relationship of complementarity by the tourist during the holiday experience. ii) the territory (its endowment of resources and its organizational structure) is argument of both the production and the utility functions, and hence the destination can be analyzed as a (meta) economic agent taking important decisions from the supply side at a level which is intermediate to the micro-level (firms and tourists) and to the macro-level (the whole economy at the country level). To understand the economics of the tourism destination, that is, how it arises, specializes, develops, and can be institutionally arranged, two key issues for the tourism destination have been identified: i) the choice between investing in the variety of the tourism product (its sophistication) or in enhancing local resources; ii) the activity of coordination of local firms, stemming from the anticommon property of the tourism product.

Building on a recent strand of literature (Andergassen & Candela, 2012a, 2012b; Candela & Figini, 2010; Candela et al., 2008; Huyberts & Bennet, 2003; Papatheodorou 2003; Wachsman, 2006) these problems have been jointly analyzed and tackled in this paper for the first time. Our theoretical set up allows to state: i) a "Love for Variety Theorem" which depicts alternative development trajectories allowing the destination to reach its economic goal: from investing in the enhancement of resources to the process of sophistication of the tourism product; ii) a "Coordination Theorem", from which different institutional set-ups can be identified, from the local destination management to the endogenous coordination provided by the tour operator.

It is important to highlight that, since in the real-world each destination has different cultural, natural and socio-economic characteristics, and since stakeholders are often called to decide in a framework of bounded and limited rationality, the model presented in this paper does not aim to reduce "ad unicum" and to propose a unique and converging model of destination development and management. On the contrary, we wish to provide a theoretical basis for the plurality of real-world solutions: in this sense, we believe that our model has more explanatory power than the TALC model. In fact, concerning coordination, we can identify:

* "Individually based destinations", in which there is no coordination between local firms operating in the tourism sector. Given our assumption of no organizational costs, or equivalently identical organizational costs, this solution is always dominated by (endogenous or exogenous) coordination. However, as we argue in the remaining of this section, this may not always be the case;

* "Community managed destinations", in which local firms are coordinated by a local authority: the destination management (that can be a public body, an association of local firms, or an outsourced destination management organization - DMO);

* "Corporate based destinations", in which the coordination is provided by a tour operator (and where it is important to distinguish whether the tour operator is a local or a foreign one).

Concerning tourism sophistication, we can identify:

* "Resource based destinations", where the tourism product is based on local resources (either natural, cultural or artificial), with a very limited variety of differentiated goods;

* "Sophistication based destinations", where local resources are very limited but the tourism product is based on a great variety of local goods and services;

* "Mixed based destinations", where there is a balance between local resources and a certain degree of sophistication of the tourism product.

Overall, since the economic problem of the destination is identified in our model by two dimensions (sophistication and coordination) and since we list three classes for each dimensions, we are theoretically able to propose a taxonomy of destinations in (at least) nine classes, at which we have to add:

* "Non-tourism destinations", regions in which investing in tourism is not economically viable or convenient.

We believe that our model is a first step in jointly analyzing these two fundamental features of tourism destinations (sophistication and coordination) that were recently introduced in the literature, and in providing a new perspective for tourism economics. We are aware of the many limitations of the model, stemming in particular from some over-simplifying assumptions that render difficult its application to real-world policy planning. However, the model is already sufficiently intricate in the present setting, and the relaxation of some assumptions might excessively complicate its solution, at least at the present state of the art.

In this respect, the main limitation is that the model is a partial equilibrium one, since the destination is analyzed in isolation. The most important extension would therefore be moving to a general equilibrium framework with inter-destination competition (by considering at least two competing destinations). A second important extension would be to introduce, in such a general setting, a multi-destination player, for example an international hotel chain that is monopolist in the sector and that owns hotels in all the destinations. This is exactly what Wachsman (2006) does in a simplified model of coordination with linear demand. It would then be very interesting to check the robustness of his results (that the advantages of intra-destination coordination tend to disappear when competition between destinations is introduced and when a monopolistic multi-player appears in both destinations) in our more general framework. Similarly, an open question would be to check what happens if coordination is provided by the same tour operator in both destinations.

Future research should also relax some other, more technical assumptions. Firstly, accounting explicitly for production and coordination costs, which may reverse the result that price coordination is optimal and which may affect in a non-trivial way investment and development strategies in the first stage of the game. In fact, if one takes organizational costs into account then the solution of no-coordination may become the optimal institutional set-up, provided that the relative organizational costs of exogenous and endogenous coordination are sufficiently large. Secondly, by assuming that differentiated tourism related goods and services are produced by more than one firm with some market power, that is, abandoning the assumption of monopolistic competition and framing the model in the

context of oligopolistic competition, one could explicitly study the more general price coordination problem where complementarities and substitutabilities, that are the core elements of the tourism product, coexist. Thirdly, real-world destinations often differ with respect to the preferences of tourists to crowding. Hence the present assumption of tourists being crowding-averse, which is tantamount to assume that a snob-effect is at work, has to be extended to the alternative assumption of mass tourism, where a band-wagon effect would be instead at work. In this respect, Swann (2010) might constitute an interesting approach to follow in a dynamic perspective. Fourtly, another extension would be to transform the multiple-stage problem in a simultaneous equilibrium in which both prices and types of investment are jointly determined. Finally, dynamics could explicitly be introduced in the model, to investigate the evolution of the destination and optimal policy intervention over time. This and other related issues are left for further theoretical research.

On a different perspective, there are many interesting questions that the model's set-up and its conclusions leave open to empirical research. Firstly, the issue of measurement of sophistication and price coordination. As regards the first concept, both the number of tourism businesses and their degree of diversification should be taken into account. At the same time, a fundamental issue regards how to estimate the importance of local resources, both in terms of quantity R and quality z. Concerning coordination, a careful measure should be able to distinguish between the different types of organizational pattern. Secondly, what are the factors determining the pattern of sophistication and coordination chosen by the destination? Is the empirical evidence coherent with our theoretical model? Thirdly, is the economic performance of the tourism destination and its evolution over time correlated with the degree of sophistication of its tourism product and with the type of coordination prevailing among firms? The answer to this question is crucial to determine the validity of the model, in which the absence of catching up and of a converging model of development for tourism destinations is a key result. While the huge body of literature in destination management can provide us with the state of the art on how to approach these empirical issues, we leave these questions open for future research.

Appendix

Proof of Lemma 1. Since there is a continuum of tourists, each one has a negligible effect on the tourism quality z. Using Lagrange for solving the problem of maximizing (3) under the budget

constraint (4), the first order conditions for the representative consumer read:

$$\left\{ y^{\beta} + z^{\beta} \left[h^{\gamma} + \left(\sum_{i=1}^{n} x_i^{\alpha} \right)^{\frac{\gamma}{\alpha}} \right]^{\frac{\beta}{\gamma}} \right\}^{\frac{1}{\beta}-1} y^{\beta-1} = \lambda \tag{16}$$

$$\left\{ y^{\beta} + z^{\beta} \left[h^{\gamma} + \left(\sum_{i=1}^{n} x_i^{\alpha} \right)^{\frac{\gamma}{\alpha}} \right]^{\frac{\beta}{\gamma}} \right\}^{\frac{1}{\beta}-1} z^{\beta} \left[h^{\gamma} + \left(\sum_{i=1}^{n} x_i^{\alpha} \right)^{\frac{\gamma}{\alpha}} \right]^{\frac{\beta}{\gamma}-1} h^{\gamma-1} = \lambda p_h \tag{17}$$

$$\left\{ y^{\beta} + z^{\beta} \left[h^{\gamma} + \left(\sum_{i=1}^{n} x_i^{\alpha} \right)^{\frac{\gamma}{\alpha}} \right]^{\frac{\beta}{\gamma}} \right\}^{\frac{1}{\beta}-1} z^{\beta} \left[h^{\gamma} + \left(\sum_{i=1}^{n} x_i^{\alpha} \right)^{\frac{\gamma}{\alpha}} \right]^{\frac{\beta}{\gamma}-1} \left(\sum_{i=1}^{n} x_i^{\alpha} \right)^{\frac{\gamma}{\alpha}-1} x_i^{\alpha-1} = \lambda p_i, \tag{18}$$

for $i = 1, ..., n$, where λ is the Lagrange multiplier. Using the assumption that all firms producing tourism related goods are symmetric we have $p_i = p$ and hence obtain $x_i = x$, for each $i = 1, ..., n$. From (17) and (18) we obtain

$$x = h \left(\frac{p}{p_h} n^{1-\frac{\gamma}{\alpha}} \right)^{\frac{1}{\gamma-1}} \tag{19}$$

while from (17) and (16) we obtain $p_h = \frac{z^{\beta} \left(h^{\gamma} + n^{\frac{\gamma}{\alpha}} x^{\gamma} \right)^{\frac{\beta}{\gamma}-1} h^{\gamma-1}}{y^{\beta-1}}$ which, using (19), reads as

$$y = h \left(p_h \right)^{\frac{1}{1-\beta}} z^{\frac{\beta}{\beta-1}} \left[1 + n^{\frac{\gamma}{1-\gamma} \frac{1-\alpha}{\alpha}} \left(\frac{p}{p_h} \right)^{\frac{\gamma}{\gamma-1}} \right]^{\left(\frac{\beta}{\gamma}-1 \right) \frac{1}{\beta-1}} \tag{20}$$

For the following it is convenient to express parameters characterizing the consumer's preferences in (1) - (3) using the definitions $\lambda_\beta \equiv \frac{\beta}{1-\beta} \in (0, \infty)$, $\lambda_\gamma \equiv \frac{\gamma}{1-\gamma} \in (-1, 0)$, $\lambda_\alpha \equiv \frac{1-\alpha}{\alpha} \in (0, \infty)$.

We calculate h substituting (19) and (20) into the budget constraint (4) and obtain

$$h(n, z) = \frac{I}{p_h \left[1 + n^{\lambda_\gamma \lambda_\alpha} \left(\frac{p}{p_h} \right)^{-\lambda_\gamma} \right] \left\{ 1 + p_h^{\lambda_\beta} z^{-\lambda_\beta} \left[1 + n^{\lambda_\gamma \lambda_\alpha} \left(\frac{p}{p_h} \right)^{-\lambda_\gamma} \right]^{-\frac{\lambda_\beta}{\lambda_\gamma}} \right\}} \tag{21}$$

where $h_n > 0$.

Substituting (21) back into (19) and (20) one obtains

$$x(n, z) = \frac{I}{p \left[n^{-\lambda_\gamma \lambda_\alpha} \left(\frac{p}{p_h} \right)^{\lambda_\gamma} + 1 \right]} \frac{1}{n + p_h^{\lambda_\beta} z^{-\lambda_\beta} \left[n^{-\frac{\lambda_\gamma}{\lambda_\beta}} + n^{\lambda_\gamma \lambda_\alpha - \frac{\lambda_\gamma}{\lambda_\beta}} \left(\frac{p}{p_h} \right)^{-\lambda_\gamma} \right]^{-\frac{\lambda_\beta}{\lambda_\gamma}}} \tag{22}$$

and

$$y(n,z) = I \frac{1}{1 + p_h^{-\lambda_\beta} z^{\lambda_\beta} \left[1 + n^{\lambda_\gamma \lambda_\alpha} \left(\frac{p}{p_h}\right)^{-\lambda_\gamma}\right]^{\frac{\lambda_\beta}{\lambda_\gamma}}}. \tag{23}$$

Since all tourists are identical, $h(j) = h$ and $x(j) = x$, and consequently $H = h$ and since $p_i = p$ it follows that $X_i = X = x$. Next we calculate the aggregate demand function $H(n, R)$, where the tourists' aggregate choice H feeds back into tourism quality z. Using (21), we have to solve the following fixed point problem:

$$H = f(p_h, p, n, z(H, R)) \equiv \frac{I}{p_h \left[1 + n^{\lambda_\gamma \lambda_\alpha} \left(\frac{p}{p_h}\right)^{-\lambda_\gamma}\right] \left\{1 + p_h^{\lambda_\beta} z^{-\lambda_\beta} \left[1 + n^{\lambda_\gamma \lambda_\alpha} \left(\frac{p}{p_h}\right)^{-\lambda_\gamma}\right]^{-\frac{\lambda_\beta}{\lambda_\gamma}}\right\}} \tag{24}$$

which yields the solution $\hat{H} = H(n, R, p, p_h)$. In view of Assumption about z, $f_H\left(p_h, p, n, z\left(\hat{H}, R\right)\right) \leq 0$, with $f(p_h, p, n, z(0, R)) > 0$ and a unique $H^\star$ solving $f\left(p_h, p, n, z\left(\hat{H}, R\right)\right) = \hat{H}$ exists.

Applying the implicit function theorem one obtains $\frac{\partial H^\star}{\partial n} = \frac{f_n}{1 - f_H} > 0$ and $\frac{\partial H^\star}{\partial R} = \frac{f_R}{1 - f_H} > 0$, respectively. After rearranging terms one obtains

$$\frac{\partial H^\star}{\partial n} = \frac{-H^{\star 2} \frac{p_h}{I} \lambda_\gamma \lambda_\alpha n^{\lambda_\gamma \lambda_\alpha - 1} \left(\frac{p}{p_h}\right)^{-\lambda_\gamma} \left\{1 + p_h^{\lambda_\beta} z^{-\lambda_\beta} \left(1 - \frac{\lambda_\beta}{\lambda_\gamma}\right) \left[1 + n^{\lambda_\gamma \lambda_\alpha} \left(\frac{p}{p_h}\right)^{-\lambda_\gamma}\right]^{-\frac{\lambda_\beta}{\lambda_\gamma}}\right\}}{1 - H^\star \frac{p_h}{I} \lambda_\beta p_h^{\lambda_\beta} z^{-\lambda_\beta} \left[1 + n^{\lambda_\gamma \lambda_\alpha} \left(\frac{p}{p_h}\right)^{-\lambda_\gamma}\right]^{1 - \frac{\lambda_\beta}{\lambda_\gamma}} \varepsilon_H^z} > 0 \tag{25}$$

and

$$\frac{\partial H^\star}{\partial R} = \frac{H^{\star 2} \frac{p_h}{I} \left[1 + n^{\lambda_\gamma \lambda_\alpha} \left(\frac{p}{p_h}\right)^{-\lambda_\gamma}\right] p_h^{\lambda_\beta} \lambda_\beta z^{-\lambda_\beta} \frac{z_R}{z} \left[1 + n^{\lambda_\gamma \lambda_\alpha} \left(\frac{p}{p_h}\right)^{-\lambda_\gamma}\right]^{-\frac{\lambda_\beta}{\lambda_\gamma}}}{1 - H^\star \frac{p_h}{I} \lambda_\beta p_h^{\lambda_\beta} z^{-\lambda_\beta} \left[1 + n^{\lambda_\gamma \lambda_\alpha} \left(\frac{p}{p_h}\right)^{-\lambda_\gamma}\right]^{1 - \frac{\lambda_\beta}{\lambda_\gamma}} \varepsilon_H^z} > 0 \tag{26}$$

Consider next the price effects. Observe that $f_H < 0$, $f_p < 0$ and that

$$f_{p_h} = -\frac{H^{\star 2}}{I} \left\{ \left[1 + \lambda_\beta + (1 + \lambda_\gamma) n^{\lambda_\gamma \lambda_\alpha} \left(\frac{p}{p_h}\right)^{-\lambda_\gamma}\right] \left\{1 + p_h^{\lambda_\beta} z^{-\lambda_\beta} \left[1 + n^{\lambda_\gamma \lambda_\alpha} \left(\frac{p}{p_h}\right)^{-\lambda_\gamma}\right]^{-\frac{\lambda_\beta}{\lambda_\gamma}}\right\} - \lambda_\beta \right\} < 0 \tag{27}$$

Applying the implicit function theorem to (24) we obtain $\frac{dH}{dp_h} = \frac{f_{p_h}}{1 - f_H} < 0$ and $\frac{dH}{dp_h} = \frac{f_p}{1 - f_H} < 0$.

An increase in R, by increasing z, increases X. Since $\beta < \alpha$ it follows that $\lambda_\alpha \lambda_\beta < 1$ and thus an

increase in n directly reduces X. Moreover, an increase in n increases H and thus reduces z, thereby indirectly reducing X.

Consider the price effects on X. It is easy to see that the direct effect of p and p_h on X is negative. But since an increase in p or p_h reduces H, by increasing z, it increases X. It can be shown that as long as $|\varepsilon_H^z|$ is not too large, the former effect dominates the latter one and thus an increase in p or p_h reduces X. ■

Proof of Proposition 2. Proof of part (a) of the Proposition is in the text. Part (b). The derivative of the denominator of Ω with respect to n is

$$-p_h^{\lambda_\beta}\lambda_\beta z^{-\lambda_\beta}\tfrac{z_H}{z}\tfrac{\partial H^\star}{\partial n}\left[1+n^{\lambda_\gamma\lambda_\alpha}\left(\tfrac{p}{p_h}\right)^{-\lambda_\gamma}\right]^{-\frac{\lambda_\beta}{\lambda_\gamma}}+$$
$$+p_h^{\lambda_\beta}z^{-\lambda_\beta}\left(-\tfrac{\lambda_\beta}{\lambda_\gamma}\right)\left[1+n^{\lambda_\gamma\lambda_\alpha}\left(\tfrac{p}{p_h}\right)^{-\lambda_\gamma}\right]^{-\frac{\lambda_\beta}{\lambda_\gamma}-1}\lambda_\gamma\lambda_\alpha n^{\lambda_\gamma\lambda_\alpha-1}\left(\tfrac{p}{p_h}\right)^{-\lambda_\gamma}$$

After substituting the expression for $\frac{\partial H^\star}{\partial n}$ in the first line of the derivative and rearranging terms we obtain

$$-\lambda_\beta p_h^{\lambda_\beta}z^{-\lambda_\beta}\left[1+n^{\lambda_\gamma\lambda_\alpha}\left(\tfrac{p}{p_h}\right)^{-\lambda_\gamma}\right]^{-\frac{\lambda_\beta}{\lambda_\gamma}-1}\lambda_\alpha n^{\lambda_\gamma\lambda_\alpha-1}\left(\tfrac{p}{p_h}\right)^{-\lambda_\gamma}\times$$
$$\frac{-H^\star\frac{p_h}{I}\lambda_\gamma\varepsilon_H^z\left[1+n^{\lambda_\gamma\lambda_\alpha}\left(\frac{p}{p_h}\right)^{-\lambda_\gamma}\right]\left\{1+p_h^{\lambda_\beta}z^{-\lambda_\beta}\left[1+n^{\lambda_\gamma\lambda_\alpha}\left(\frac{p}{p_h}\right)^{-\lambda_\gamma}\right]^{-\frac{\lambda_\beta}{\lambda_\gamma}}\right\}+1}{1-H^\star\frac{p_h}{I}\lambda_\beta p_h^{\lambda_\beta}z^{-\lambda_\beta}\left[1+n^{\lambda_\gamma\lambda_\alpha}\left(\frac{p}{p_h}\right)^{-\lambda_\gamma}\right]^{1-\frac{\lambda_\beta}{\lambda_\gamma}}\varepsilon_H^z}+$$

Using the equilibrium expression for $H^\star$ (24) the derivative of Ω with respect to n can be written as

$$\Omega_n(R,n)=-\frac{\Omega^2}{I}\lambda_\beta p_h^{\lambda_\beta}z^{-\lambda_\beta}\left[1+n^{\lambda_\gamma\lambda_\alpha}\left(\frac{p}{p_h}\right)^{-\lambda_\gamma}\right]^{-\frac{\lambda_\beta}{\lambda_\gamma}-1}\times$$
$$\frac{\lambda_\alpha n^{\lambda_\gamma\lambda_\alpha-1}\left(\frac{p}{p_h}\right)^{-\lambda_\gamma}}{1-H^\star\frac{p_h}{I}\lambda_\beta p_h^{\lambda_\beta}z^{-\lambda_\beta}\left[1+n^{\lambda_\gamma\lambda_\alpha}\left(\frac{p}{p_h}\right)^{-\lambda_\gamma}\right]^{1-\frac{\lambda_\beta}{\lambda_\gamma}}\varepsilon_H^z}(\varepsilon_H^z\lambda_\gamma-1)$$

which establishes the result. ■

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