Estimating Tourism Effects on Residents: a Choice Modelling Approach to the Case of Rimini

Paolo Figini, Massimiliano Castellani, Laura Vici

University of Bologna

1 Introduction

For tourist destinations, sustainable economic development requires, together with the attainment of economic efficiency, environmental protection and social cohesion. This latter aspect implies that the local community has to be actively involved in the planning and in the management of the tourism sector, and that (the great part of) tourism earnings have to be fairly distributed among the residents.

Desires and aspirations of local residents, and their attitudes towards tourists should be carefully taken into consideration by tourism planners (Akis, 1996; Faulkner and Tideswell, 1997). The success of many tourism development programs depends on a local management that is sensible both to the social impact of tourism on the host population, and able to increase the benefits derived from tourism by preventing or reducing its negative aspects.

Overall, tourism has both positive and negative externalities on local populations. Previous studies corroborate these effects: Doxey (1975) finds that local residents' attitudes towards tourism may oscillate between euphoria and antagonism (see also Castellani et al. 2007). In this paper we studied how residents are affected by tourism and how they adjust their choices with respect to these effects. This approach might lead to important policy implications: policy makers are aware that tourists and resi-

dents needs are often conflicting, and they need precise tools of analysis in order to measure this trade-off and to design their policies.

In the last 15 years, the socio-economic impact of tourism and the factors affecting attitudes towards tourism in host communities have received significant attention (Alberini et al., 2005; Akis et al., 1996; Crotts and Holland, 1993; Faulkner and Tideswell, 1997; Haralambopoulos and Pizam, 1996; Lindberg et al., 1997a, 1997b, 1999; Zanatta et al., 2005). In particular, tourism impact is often disaggregated into three categories: economic, socio-cultural and environmental (Bull, 1991; Pearce, 1989a, Ryan, 1991; Williams, 1979). Since tourism generally disrupts social, cultural and environmental local systems, the non-economic impact often tends to be negative as a whole (Liu et al, 1987), whilst economic effects are perceived as positive.[1] Economic impacts are known and well measured because estimated for different purposes (Dwyer and Forsyth, 1993), whereas social and environmental effects are of difficult evaluation. Therefore, the overall benefit of tourism development is often overestimated, and might drive to sub-optimal policy decisions (Freeman 1993). The intensity and the direction of the overall impact depends on a variety of socio-cultural and economic factors associated to the local destination, including the nature of tourism activities, tourists' personal characteristics, and the pace of tourism development (Haralambopoulos and Pizam, 1996; Wall and Mathieson, 2005).

Our study analysed residents' preferences by means of the choice modelling, a survey-based technique often used to place a value on a non-marketable or semi-public good. Its use has spread in many research fields (marketing, cultural, health, transport and environmental economics) and in recent years it has often been applied in tourism economics to analyse tourists' preferences with respect to trip attributes, recreational and heritage demand, the attractiveness of the destination and tourism policies.[2] In

[1] The most important benefits include the generation of jobs and new business opportunities, the increase in the number and types of facilities, of recreational and entertainment opportunities available to residents, and the spread of new ideas into the community. On the other hand, the costs are mainly stemming from the increase in crime, noise level, pollution, degree of congestion, and to the negative impact on local culture. Pizam and Milman (1984) identified occupational, cultural, demographic impacts, mutation of consumption patterns, transformation of norms, impact on the environment. Similarly, Pearce (1989a) indicated six classes of social and cultural effects, while Travis (1984) listed socio-cultural costs and benefits that may affect tourism destinations.

[2] Among the many papers that in tourism economics recently used this methodology, we mention Apostolakis and Shabbar (2005), Brau and Cao

contrast to the main stream of the tourism literature, our paper focussed on the preferences of residents and local stake-holders regarding possible and hypothetical modifications in the urban and territorial configuration. Interviews to a representative sample of the population were conducted to estimate the willingness to pay (WTP) for (hypothetical) changes in the composition of goods.

Stated preference methods offer advantages in analysing trade-offs between tourists and residents. In particular, the possible trade-off with the local population stems from the fact that the most important resource for tourism - the environment or, more generally, the territory – is to be shared with residents. Since the "holiday" can be seen as a set of different characteristics which compose a generic good, choice experiments seem to fit data better than other stated preference methods

The destination analysed in this paper, Rimini, is one of the major Italian seaside resorts and mass tourism destinations, with more than ten million overnight stays only in the summer months (Orsingher, 2004). Located on the Adriatic sea, Rimini is a middle-size city, with about 130,000 inhabitants and an income per capita of more than € 17,000 (higher than the Italian average). Although tourism represents one of the main economic sectors of the city, Rimini is now a destination in the mature stage of its development, and has been undergoing a strong diversification in the manufacturing sector and in business and cultural tourism. To summarise, different types of tourists and different types of residents[3] share the destination and ask for alternative uses of the (scarce) territory. In this paper, we focussed on residents' preferences, while we refer to Brau et al. (2008) for the analysis of tourists preferences; in the final discussion we compared our results with those of Brau et al. (2008) in order to identify synergies or trade-off in the use of the territory and to discuss some policy implications.

In particular, we aimed to detect the effects on residents preferences of changes in the intensity (levels) of six key characteristics (attributes) that identify the use of Rimini's territory.[4] Residents were interviewed in Spring 2006 and asked to indicate their preferred choices among several pairs of hypothetical alternative scenarios differing in the levels of the six

(2006), Breffle and Morey (2000), Crouch and Louviere (2004), Huybers and Bennett (2000), Huybers (2005), Morey et al. (2002) and Papatheodorou (2001).

[3] Preferences of residents might change accordingly to whether they work or not in the tourism sector.

[4] Recent papers on tourist preferences in Rimini are Candela et al. (2007), Figini and Troia (2006), Orsingher (2004), and Scorcu and Vici (2008).

attributes. Conditional logit models enabled us to estimate the relative weight of each attribute in affecting the residents' choice and allowed us to compare their preferences with those of tourists. To the best of our knowledge, this is one of the few attempts to explicitly use choice modelling to analyse residents preferences in connection with tourism. Lindberg et al. (1999 and 2001) used choice experiments in Åre (Sweden) to evaluate residents' willingness to accept negative impacts of tourism development (in particular in a sky resort) provided that they also receive positive effects.

The remaining of the paper is structured as follows: in Section 2 we briefly review the methodology applied and we describe the questionnaire. Section 3 illustrates some descriptive statistics. Section 4 presents the main econometric results of the choice experiments while Section 5 discusses the policy implications and sets the agenda for future research.

2 The methodology and the survey

The choice modelling is a stated-preference approach which investigates individual behaviour and estimates the value of goods (or projects) by asking people to choose among scenarios whose differences are due to systematic combinations of diverse attribute (characteristic) levels.[5] One of the advantages of choice experiments lies in their ability to model individuals' hypothetical choices for non market goods. This enables analysts to elicit individuals' willingness to pay for goods and services that may otherwise be unattainable from observing actual behaviour. This methodology develops through three main steps (Hanley et al. 2001; Mazzanti 2003): i) identification of the basic characteristics (attributes) of the good or project to be evaluated, which can take different values (levels); ii) each respondent has to choose among alternative hypothetical scenarios characterised by different combinations of the attribute levels; iii) the econometric analysis of their answers allows to estimate the relative importance of different attributes and, if a monetary factor or a price is included as attribute, the willingness to pay for different levels.

[5] For an overview of the main differences among alternative stated preferences methodologies, particularly with respect to contingent valuation, see Brau (2006) and, more extensively, Bateman et al. (2002), Bennet and Blamey (2001), Louvière et al. (2000), and Mazzanti (2003).

Consistently with the random utility theory (Thurstone 1927; McFadden 1974), consumers' utility is considered a latent structure that cannot be observed directly. By designing and implementing a valid preference elicitation procedure, preference orderings for a subset of choice options allows to assess a significant proportion of the unobservable consumer utility. The chosen scenario in each experiment corresponds, *ceteris paribus*, to the combination of attribute levels bringing the highest utility.[6]

Formally, given a sample of H respondents, with h=1,2,…,H, and a set of alternative choices, j=1,2,…,J, the random utility specification can be represented as a linear additive specification with independently and identically distributed (IID) random terms (Louviere et al. 2000):[7]

$$U_{hj} = \beta' x_{hj} + \varepsilon_{hj}. \tag{2.1}$$

where the unobservable utility value for the choice alternative j made by consumer h is given by a deterministic and systematic component and a random term, ε_{hj}.

In model (2.1), the probability that an individual h picks alternative i out of J alternatives, can be represented as follows:

$$P[y_h = i] = \frac{\exp(\mu\beta' x_i^h)}{\sum_{j=1}^{J} \exp(\mu\beta' x_j^h)} \tag{2.2}$$

where y_h is a choice index, representing the choice made by individual h, and μ is a scale parameter that typically assumes value 1 (Ben-Akiva and Lerman 1985).[8] Moreover, the estimation of equation (2.1) with a conditional logit model, yields β coefficients allowing to evaluate the rate at which respondents are willing to trade-off one attribute to another. This

[6] Lancaster's hedonic theory (1966, 1971), which states that goods are not demanded *per se*, but for their elementary characteristics, can be considered the theoretical foundation of discrete choice models.

[7] The IID assumption entails the property of independence of irrelevant alternative (IIA - McFadden 1984). Violations of the IIA assumption may arise when some alternatives are qualitatively similar to others or when there are heterogeneous preferences among respondents (Bateman et al. 2002; Morrison et al. 1996). If IIA is violated, alternative choice models should be used, such as the nested logit model (Louviere et al. 2000) or the multinomial probit model (Hausman and Wise 1978).

[8] The scale factor μ is inversely proportional to the standard deviation of the error distribution. Assuming μ equal to 1 implies a constant error variance.

rate of substitution σ is calculated as the ratio between the β coefficients of two attributes. When attributes are discrete variables, the substitute ratio σ is computed as "values of level change", as in (2.3).[9]

$$\sigma = 1 - \frac{\beta^i \Delta x_i}{\beta_s} \tag{2.3}$$

Specifically, in this paper we considered six attributes (and their levels), which are described in Table 1 and define the alternative scenarios.[10] The questionnaire was designed to gather information about the residents' perception of actual or hypothetical uses of Rimini territory. Direct interviews to a representative sample of Rimini population were conducted in months of February, March and April 2006.

There are several reasons why these attributes were selected. First, we had to consider important features of Rimini as regards potential interactions with tourists (trade-off and synergies) in the use of the territory and in terms of actual political debate. Since traffic congestion reduces available spaces for residents and increases time spent to commute and to reach commercial and leisure facilities, mobility risk was included as a first attribute. In order to make this attribute more concrete, we considered the project of building a coastal train connecting Rimini seaside suburbs, which is already approved and financed. The coastal train would have the effect to facilitate mobility of residents and tourists over the seaside area (therefore, reducing the traffic congestion).

The other attributes considered in the experiment were the traffic limitations on the seaside avenue (attribute n. 3) and the use of beach facilities (attribute n. 5), since in summer months the seaside area becomes,

[9] When the attribute is expressed in monetary terms, this trade-off σ is an "implicit price". These estimates rely on the assumption that the marginal utility of income is constant.: this holds only when small changes are considered (involving a tiny share of total individual income).

[10] The identification of the six attributes and their levels was the result of frequent research meetings; a pilot test was carried out in the weeks preceding the survey and proved very useful to check the comprehension of the attributes, the clear perception of the difference in levels, and the relevance to residents of alternative scenarios. The pilot test confirmed as well that the structure of the survey was such to raise some expectation about the use of the information provided for decision making purposes. In fact, if the respondents view the process as entirely hypothetical, then their responses do not convey any economic sense (Carson 2000).

for residents as well as for tourists, the center of Rimini's cultural and recreational life.

Sustainability considerations and policies aimed at protecting and developing natural and cultural resources are common features of contemporary policy agendas. Rimini is a mass tourism destination, but also a middle-size city, and the residents' willingness to pay for a more environmental-friendly city might play a crucial role both in the policy strategy, and in terms of tourism development. This reason motivated the inclusion in the survey of the attributes of environmental protection of the beach (attribute n. 2) and of product differentiation through (new) cultural activities (attribute n. 4).[11]

Finally, the monetary attribute included in the survey was represented by a hypothetical local tax that residents should pay for improvements in the use of the territory (attribute n. 6).[12]

[11] The attributes and their respective levels were very similar to the ones submitted to tourists in a parallel inquiry (Brau et al. 2008). Although some differences exist, particularly on the monetary and the cultural attributes, this allowed us to compare, at least partially, the elicited preferences of tourists and residents over the shared territory of Rimini.

[12] In choosing the levels of the monetary attribute, we had to balance four features: i) the levels should be in line with the projects involved, once alternative (and realistic) sources of financing (sponsorship, private co-financing, state intervention) were considered; ii) they should be expressed in an easy metric; iii) ideally they should span over the distribution of people's willingness to pay; iv) finally, we had to overcome the fact that in Italy the local administrations do not have the possibility to raise taxes dedicated to finance local projects (taxes are mainly transfers from the state).

Table 1. Definition of attributes and their levels

Attribute 1 – Risk of reduced mobility and traffic jams
Level 1 (*high mobility risk – status quo*): during the whole year, but particularly during summer months, roads and the transport system reach their carrying capacity, not allowing full mobility of people.
Level 2 (*low mobility risk*): the development of the coastal train allows full mobility of people and relieves the traffic system below its carrying capacity.
Attribute 2 – Environmental impact of bathing establishments and other beach services
Level 1 (*high preservation of beach environment*): The environmental impact of bathing establishments and other beach services, bars and restaurants is low (rare and small concrete buildings).
Level 2 (*medium preservation of beach environment*): there is a fair number of concrete buildings for essential services (first aid, emergency rescue, bars).
Level 3 (*low but temporary preservation of beach environment*): there is a high number of temporary buildings (e.g., in wood) for beach services, that can be removed during winter months.
Level 4 (*low preservation of beach environment – status quo*): there is a high number of permanent buildings (in concrete) for bathing establishments and other beach services.
Attribute 3 – The summer use of the seaside avenue
Level 1 (*pedestrian coastal road*): the seaside avenue is for pedestrian use, with large areas for bicycles and with decentralised parking lots.
Level 2 (*no limited traffic zone – status quo*): the seaside avenue is open to circulation, with parking lots close to the beach and no pedestrian areas.
Attribute 4 – The cultural offer
Level 1 (*status quo*): the city offers a few museums and a good level of heritage conservation.
Level 2 (*cultural scenario based on winter months*): Cultural investment is focussed in low-tourist season, particularly on the needs of residents.
Level 3 (*cultural scenario based on summer months*): Cultural investment is focussed in summer months, particularly on the needs of tourists.
Level 4 (*cultural scenario all year long*) Cultural investment is not focussed in any particular season, but aims to increasing the cultural heritage of the city.
Attribute 5 – Evening and night use of beach facilities
Level 1 (*beach services open during the day – status quo*): at night, limited access to the beach; bathing establishments and other beach services are closed to the public.
Level 2 (*night opening of beach services*): evening and night opening hours of bathing establishments and other beach facilities, with cultural events and shows.
Attribute 6 – Level of taxation needed to finance the projects
Level 1 (*status quo*) – no tax levied.
Level 2 (*low taxation*) - € 4 per month levied.
Level 3 (*medium taxation*) - € 8 per month levied.
Level 4 (*high taxation*) - € 12 per month levied.

The full factorial of all the possible combinations of attribute levels would yield, in our case, 512 scenarios. A orthogonal fractional factorial design was used to reduce the number of profiles at a convenient size: 32 scenarios were identified. Pair-wise comparisons were created using the shifted design strategy (Louviere et al. 2000).[13] The interviews were hence split into four groups whose respondents had to answer to different sets of 8 choice cards with different pairs of hypothetical alternative scenarios.[14] We explicitly did consider a *status quo* alternative, asking the respondents whether they prefer it over the two alternatives.[15]

Overall, the survey was divided into four sections:[16] the first one collected the main coordinates of the interview (date, location and length); the second part inquired into the socio-economic and demographic characteristics of the respondent and his/her household; the third section was the choice experiment and asked to choose among eight pairs of alternative scenarios, while the fourth section brought together some other information about the test comprehension. In particular, the interviewer annotated the degree of comprehension, interest and facility both in answering questions and in choosing the alternatives. Problems of poor identification of alternative scenarios were not relevant: the reported level of comprehension was high (98% of the sample understood the questionnaire) and the

[13] Zwerina and Huber (1996) introduce four principles that a choice design should jointly satisfy in order to convey efficient estimates. Bunch et al. (1996), in evaluating generic choice designs, show that shifted designs generally have superior efficiency compared with other strategies, although for most combinations of attributes, levels, alternatives and parameters it is impossible to create a design that satisfies the four principles (Kessels et al. 2006).

[14] The pilot test showed that respondents could cope with up to eight choice pairs each. In fact, violations related to instability of preferences can arise from learning and fatigue effects (Hanley et al. 2002). In order to make clear and homogeneous the comprehension of attributes and to facilitate the individual decision process, the oral explanation of these attributes and levels was accompanied by the presentation of drawings and photos describing each scenario. In each group, the cards submitted were the same but presented every time with a different sequence, in order to avoid any question order bias.

[15] The explicit definition of the *status quo* allows for a more coherent evaluation of the proposed scenarios (Brau 2007). In our case, only 7% of the stated preferences were not confirmed after the comparison with the *status quo*. On the use of consequentiality design in stated preference models see Boxall and Adamowicz (2002) Carson et al (2002), Cummings and Taylor (1998), Landry and List (2007), Provencher et al. (2002), Train (1998).

[16] The questionnaire is available from the authors upon request.

differences in the attributes levels were clearly perceived. Interviews took on average 26 minutes.

3 Residents' demographic and social characteristics

The questionnaire was submitted to a sample of 606 residents, stratified by gender, age, education, professional status and economic activity. This last aspect is crucial, since respondents' attitude is likely to be driven by the existence of any business connection, direct or indirect, with the tourism sector. Among active workers, 1.2% work in the primary sector, 14.4% in manufacturing, 7% in building, 22.4 % in trade, 14.1% in tourism and 40.8% in other services. However, this datum is likely to underestimate the economic importance of tourism.[17] To include indirect as well as direct effects of (and links to) tourism we asked respondents to what extent their business is linked to tourism. 21.9% of the survey answered that at least 80% of their business is driven by tourism demand and another 17.2% estimated that tourism generates between 40% and 79% of their business. 9.5% of the sample estimated that tourism generates between 20% and 39% of their business while about half of the sample (51.5%) considered not to be (or very little) linked to tourism demand.

The distribution of respondents' characteristics was consistent with our sampling plan and representative of the whole population of Rimini. Table 2 suggests that the sample was also representative as regards income, usually the most difficult variable to investigate. The distribution of net personal income was as expected, and the percentage of non-respondent – 11.9% was quite low. With respect to educational attainment, 24.3% of the sample owns a University degree, 37% a secondary school diploma, and 38.3% a primary degree, also in line with the population characteristics. Finally, the occupational and professional status of respondents are described in Table 2.

[17] There are two main reasons why data on economic activity are likely to underestimate the importance of tourism. First, many non-tourism activities in a city like Rimini might primarily serve tourists (let us think about a shop situated close to the beach); second, property letting might be an important source of income which does not stem from the respondent's main economic activity. In this respect, 15% of the sample declared that to have an apartment to rent, of which 2.5% rents only to tourists, 6.1% rents also to tourists while 6.4% does not rent at all to tourists.

Table 2. Demographic and socio-economic characteristics of the sample

Age class	%	Occupational / professional status	%
< 30	16.5	Entrepreneur	6.9
30 – 39	21.6	Professional	9.4
40 – 49	18.2	Craftsman	4.5
50 – 59	13.4	Manager	2.3
≥ 60	30.4	Dealer	11.9
		Employee / white collar	18.0
Income class (Euro)	%	Worker / blue collar	9.2
< 10,000	14.5	Other	3.7
10,000 – 14,999	18.3	House working	7.3
15,000 – 19,999	21.6	Student	3.8
20,000 – 24,999	18.6	Retired	20.5
25,000 – 39,999	11.1	Unemployed	2.5
≥ 40,000	4.0		
N.A.	11.9	Gender	%
		Males	52.3
		Females	47.7

As discussed in the introduction, tourism might produce positive and negative effects on residents and on the city; in fact, only 15.9% of the sample thought that tourism has no effects on general life conditions, while 66.6% perceived that life conditions improve, and only 17.5% thought that tourism brings an overall worsening. Table 3 summarizes the main positive and negative impacts of tourism on the city welfare. Not surprisingly, and in line with previous researches on tourism impact, economic effects (higher income levels, job opportunities, etc.) overcome social and environmental effects frequently perceived as negative (increase of noise level, crime rates, etc.): 50.7% of the sample thought that tourism has an overall positive economic impact, whilst 10.2% of the sample mainly saw the negative impact on traffic and mobility.[18]

[18] Among people whose business was related to tourism, 78.5% thought that it has a positive effect, 8.2% no effect and 13.3% a negative effect. Among people whose business was not related to tourism this distribution changed to 59.2% (positive effect), 18% (no effect) and 22.8% (negative effect).

Table 3. Perceived positive and negative effects of tourism

Type of effect	%	
No effect on general life conditions		15.9
Positive effects on general life conditions		66.6
- Economic improvement	50.7	
- Environmental and health services improvement	0.4	
- Recreational, cultural and sport activities improvement	15.5	
Negative effects on general life conditions		17.5
- Less efficiency of public services	2.0	
- Increase in the level of pollution	1.0	
- More criminality and less security	2.5	
- Worsening of traffic and mobility	10.2	
- Other	1.8	

Finally, another characteristics which is likely to interact with stated preferences is the travel mode to commute in the city: 45.7% of the sample uses the car while another 11.7% the motorcycle or the scooter. Only 23.1%, 12.7% and 6.6% of the sample use environmental-friendly travel modes: bicycle, foot and public transport respectively.

4 Econometric results

Table 4 presents the results of a conditional logit model estimated for the whole sample and for two sub-samples based on whether residents' job activity is (at least) partially linked to tourism or not.[19] All the attribute

[19] We inserted an alternative-specific constant (ASC) to capture those characteristics of the choice not included otherwise in the model. In our case, there might be a tendency of individuals to prefer any scenario labelled 'A' (on the left of the card presented) over any other scenario labelled 'B' (on the right of the card). This is a frequent finding in such models (Louviere et al, 2000), and the inclusion of the alternative-specific constant allows to effectively

levels, which are described in Table 1, were elaborated as dummy variables, with the exception of the tax levied, which took four different quantitative values corresponding to four distinct tax rates. The 0-values for the dummy variables were set up on the *status quo* (high mobility risk, low environmental protection of the beach, seaside avenue open to traffic, present cultural offer, beach services close at night, and no extra-tax levied). Since each hypothetical scenario was planned to "improve" the quality of the city, we were expecting positive signs for all the coefficients, except taxes.

The maximum likelihood estimates show that for the whole sample all the coefficients were statistically significant and with the expected sign, with the exception of those related to the environmental protection of the beach.[20]

In order to control for preference heterogeneity, we decided to use two main approaches.[21] Firstly, we estimated the main-effect model for different sub-samples, based on socio-demographic and economic characteristics (Tables 4 and 5). Robust results emerge: neither different aged people, nor different income classes pay attention to the preservation of the beach (Table 5). Even residents whose activity is based on tourism seem not to be affected in their choice by the level of beach preservation (Table 4). This might be due to the fact that, on the one hand, these levels are not perceived so different from the present situation, which has high permanent impact (perhaps because the seaside is mainly lived during the summer); on the other hand, it is probably true that the typical Rimini's skyline, shaped by huge bathing establishments and high anthropic presence in its seaside resource, is perceived as a milestone of the city landscape: a change would not be pleased.[22]

control for this behaviour.

[20] The temporary preservation of the beach's coefficient has a negative sign, significant at the 10% level only in the whole sample.

[21] An alternative way to include preference heterogeneity consists of using the mixed logit model (Train, 2003). However, such approach requires important assumptions on the form of distribution of the random parameters. If the distributional form is misspecified the estimates are not consistent.

[22] Even if the pilot test confirmed that permanent and temporary preservations of the beach were perceived as different environments by residents, their choices were not significantly affected by different environmental policies.

Table 4. Estimation of conditional logit model: whole sample, tourism-based and non-tourism based local workers

Attributes and levels	Complete sample	Tourism-based job[+]	Non-tourism-based job[++]
Low mobility risk	0.305***	0.296***	0.354
	(0.033)	(0.048)	(0.078)
High preservation of beach environment	-0.052	-0.099	-0.065
	(0.058)	(0.086)	(0.135)
Medium preservation of beach environment	0.080	0.082	0.065
	(0.066)	(0.096)	(0.158)
Low (but temporary) preservation of beach environment	-0.100*	-0.112	-0.273
	(0.058)	(0.084)	(0.148)
Pedestrian coastal road	0.653***	0.713***	0.509***
	(0.034)	(0.049)	(0.079)
Cultural scenario based on winter months	0.623***	0.568***	0.659***
	(0.058)	(0.085)	(0.139)
Cultural scenario based on summer months	0.206***	0.108	0.212
	(0.065)	(0.094)	(0.156)
Cultural scenario all year long	0.447***	0.473***	0.367***
	(0.055)	(0.080)	(0.130)
Night opening of beach	0.665***	0.713***	0.762***
	(0.033)	(0.048)	(0.079)
Monthly tax levied	-0.032***	-0.023***	-0.032***
	(0.005)	(0.023)	(0.011)
Alternative specific constant	-0.056*	-0.040	-0.039
	(0.033)	(0.047)	(0.078)
Log likelihood	-2806.72	-1335.86	-497.158
Pseudo R^2	0.165	0.181	0.170
Nr. Of observations	9696	4704	1728

Note. *: significant at the 10% level; **: significant at the 5% level; ***: significant at the 1% level.
[+]: Sample composed by respondents who answered that at least 20% of their business is linked to tourism demand.
[++]: Sample composed by respondents who answered that none of their business is linked to tourism demand.

An alternative approach to deal with individual heterogeneity would be to estimate an extended model including higher order interactions between attribute levels and socio-demographic characteristics. In this way it is also possible to check whether preferences for the level of one attribute depend on other attribute levels. The vast majority of choice experiments use the main effect design only, explicitly or implicitly assuming that interactions among attributes are not significant. However, if interactions are significant, such omission leads to sub-optimal results (Hensher et al. 2005). In our experiment, the interaction coefficients were not statistically significant.[23]

The β coefficients estimated under the conditional logit model can be used to estimate the rate at which respondents are willing to trade-off one attribute to another, as equation (2.3) suggests. This information provides a ranking of attribute importance that could be used by the local policy maker in designing welfare enhancing policies. The higher the ratio, the higher the relative weight of the attribute in the scenario.

Results showed that residents attach by far a great value to the possibility to stay on the beach even during the night, where shows and events could be organized, and to the pedestrian use of Rimini's esplanade. While these findings show a potential synergy with tourists in their willingness to have "a sea-side with a human face", the coefficients of the cultural attribute show a potential trade-off. In fact, residents would prefer a more lively cultural scene mainly in winter months and, only as second best, all-year long. More cultural events during summer months would be accepted only as a third best. Clearly, residents suffer a city cultural offer too biased towards summer months when, probably, cultural events are difficult to consume due to both tourists overcrowding and to the fact that many residents work (if they have tourism-based jobs) or are away for their own holidays. The importance of low mobility risk achieved by the coastal train was positively evaluated, but its importance was estimated to be half of that given to the pedestrian use of the seaside avenue.

[23] The only statistically significant interaction concerned residents whose business is linked to tourism, and the coefficient confirmed that they do not appreciate a pedestrianisation of the seaside avenue. However, we tested the joint hypothesis that all the interactions of the extended model were not statistically significant with respect to the basic model of Table 4. We accepted the null hypothesis that all the coefficients of the additional interaction terms were identically equal to zero ($\chi 2(18)=13.10$ with a p-value=0.7857). Complete results are available from the authors upon requests. See also Figini et al. (2007).

Table 5. . Estimation of conditional logit model: different age sub-samples; low-income and high-income sub-samples

Attributes and levels	The Young (<30)	The Adults (30-59)	The Elderly (≥60)	Low-income (≤18000)	High-income (>18000)
Low mobility risk	0.336***	0.299***	0.321***	0.326***	0.283 ***
	(0.082)	(0.045)	(0.061)	(0.047)	(0.047)
High preservation of beach environment	-0.197	-0.058	0.064	-0.089	-0.025
	(0.146)	(0.080)	(0.106)	(0.083)	(0.082)
Medium preservation of beach environment	-0.081	0.108	0.145	0.053	0.091
	(0.165)	(0.091)	(0.121)	(0.095)	(0.093)
Low (but temporary) preservation of beach environment	-0.256*	-0.095	0.004	-0.151*	-0.057
	(0.140)	(0.081)	(0.107)	(0.082)	(0.083)
Pedestrian coastal road	0.584***	0.635***	0.745***	0.791***	0.521 ***
	(0.083)	(0.046)	(0.062)	(0.049)	(0.047)
Cultural scenario based on winter months	0.864***	0.559***	0.589***	0.716***	0.554 ***
	(0.150)	(0.080)	(0.108)	(0.085)	(0.082)
Cultural scenario based on summer months	0.285*	0.148*	0.242**	0.264***	0.161 *
	(0.162)	(0.090)	(0.119)	(0.092)	(0.092)
Cultural scenario all year long	0.699***	0.400***	0.414***	0.429***	0.462 ***
	(0.140)	(0.076)	(0.099)	(0.078)	(0.079)
Night opening of beach	0.678***	0.702***	0.609***	0.737***	0.601 ***
	(0.083)	(0.045)	(0.061)	(0.048)	(0.047)
Monthly tax levied	-0.022**	-0.031***	-0.042***	-0.037***	-0.028 ***
	(0.012)	(0.007)	(0.009)	(0.007)	(0.007)
Alternative specific constant	0.081	-0.044	-0.149**	-0.063	-0.049
	(0.081)	(0.045)	(0.060)	(0.046)	(0.046)
Log likelihood	-453.82	-1491.38	-848.362	-1415.14	-1381.10
Pseudo R^2	0.1816	0.1647	0.1685	0.1975	0.1352
Nr. Of observations	1600	5152	2944	5088	4608

Note. *: significant at the 10% level; **: significant at the 5% level; ***: significant at the 1% level.

When the attribute being sacrificed is monetary, the estimated trade-offs are "implicit prices", the amount of money respondents are willing to pay in order to receive a change in the considered attributes. The estimate of implicit prices, reported in Table 6, are made on a *ceteris paribus* hypothesis, namely for an increase in the attribute of interest given that everything else is held constant. In line with results presented in Table 4, a comparison of implicit prices for attributes allows to rank their relative importance for each group of respondents.[24]

Although respondents were sensitive to price differences within the experiments, the weight given to the price attribute was apparently very low and the real tax that residents were actually willing to pay for closing the seaside avenue oscillates between the high values of 15 and 32 Euro per month, depending on the group of residents (Table 6).

We expected that residents perceptions towards the socio-economic impact of tourism would be, *ceteris paribus*, a function of their direct economic dependency on the tourism industry (Haralamopoulos and Pizam 1996). Non surprisingly, residents whose activities are based on tourism were less willing to pay for a pedestrian seaside avenue. In fact, tourism activities in Rimini are mostly located along a parallel avenue, provided with a large pavement; the opening of a larger and pedestrian area nearby, with shows and tourist attractions could threaten many firms' turnover. As discussed above, this result was robust to the inclusion in the model of second-order interactions (see Figini et al. 2007).

People aged over 60 were less willing to pay for the opening of the beach during the night, probably because they are more inclined to visit the beach during the day. On the other side, people with the highest willingness to pay for the organization of events on the beach during the night and for the pedestrianisation of the seaside avenue were residents whose activity is not linked to tourism. These people are probably direct users of tourist services, and for that reason they are more willing to pay for this sort of public investment.

[24] Note that we are dealing with discrete (and not marginal) level variations and that estimates are based on the assumption that the marginal utility of income is constant.

Table 6. Implicit prices (Euro per month)

Level changes	Whole sample	Non Tourism based job	Tourism based job	The young	The Adults	The elderly	Low income	High income
Risk of overcrowding	9.47	13.10	11.03	14.65	9.59	7.73	8.81	10.14
Variation in beach impact from high permanent to minimal impact	NSS	NSS	NSS	NSS	NSS	NSS	NSS	NSS
Variation in beach impact from high permanent to medium impact	NSS	NSS	NSS	NSS	NSS	NSS	NSS	NSS
Variation in beach impact from high permanent to high temporary impact	-3.11	-4.94	NSS	-11.14	NSS	NSS	-4.09	NSS
Promenade for pedestrians	20.29	31.50	15.86	25.44	20.38	17.93	21.39	18.61
Cultural public investment only during the winter	19.33	25.10	20.54	37.63	17.94	14.17	19.36	19.81
Cultural public investment only during the summer	6.39	NSS	NSS	12.42	4.74	5.83	7.13	5.74
Yearly cultural public investment	13.88	20.89	11.43	30.46	12.84	9.96	11.60	16.53
Beach open by night	20.66	31.49	23.74	29.53	22.54	14.65	19.92	21.49

Note: when the coefficients of Table 4 or 5 were not statistically significant (NSS), the implicit prices were not computed.

Substitution rates and implicit prices provide important pieces of information to policy makers. In addition to the information on the "price" residents are willing to pay for any level of the considered attributes, policy makers learn the relative importance of each attribute in the residents' utility structure. This would allow local authorities to modify the tourist product (through multiple and simultaneous changes in the attribute levels) in order to make it consistent with residents' structure of preferences.

A different combination of levels for these attributes could improve the empathy between tourists and residents. To make this point clearer, a simulation in which policy makers could create possible alternative scenarios was built. It must be recalled that this simulation, which considered more than two alternatives at the same time, was based on the IIA assumption, which allows for creating hypothetical products by different combinations of attribute levels.

We chose four scenarios differing in the level of five attributes (the levied tax was excluded): the current situation (status quo), an environment friendly scenario, a mass-tourism scenario, and a resident friendly scenario, which attributes and levels are presented in Table 7. We inferred from the econometric estimates the probability that residents chose for one of these scenarios,[25] thus leading to interesting implications for the policy agenda.

Table 7. Simulation of choice probabilities

Attributes	**Status quo**	**Environment friendly scenario**	**Mass-tourist scenario**	**Resident scenario**
Promenade	vehicles	pedestrians	pedestrians	pedestrians
Overcrowding	high risk	low risk	high risk	high risk
Environment (beach) preservation	low permanent	high	low temporary	medium
Cultural supply	limited investment	yearly investment	summer investment	winter investment
Beach by night	close	close	open	open
Choice probabilities				
Complete sample	4.37%	16.93%	33.89%	44.81%
Tourism based job	4.34%	17.32%	31.76%	46.57%
Non-tourism based job	4.73%	15.14%	30.65%	49.48%
The young	4.07%	16.86%	35.08%	43.99%
The adults	4.63%	16.57%	32.50%	46.30%
The elderly	3.89%	18.20%	34.68%	43.24%
Low income	4.37%	16.93%	33.89%	44.81%
High income	3.37%	14.48%	35.63%	46.52%

Surprisingly, although choice probabilities were different among groups of residents, the ranking of these alternative scenarios was unanimously accepted: the worst scenario was the *status quo*, whilst the most preferred scenario was the tourist product respectful of residents' habits. Moreover, residents did not pay much attention to an environment friendly tourism product.

[25] The probability that an individual picked each scenario out of the four alternatives was computed by inserting in equation (2.2) the coefficient estimated in Tables 4 and 5.

Analogously, by exploiting the estimates obtained in the study on tourists' preferences in Rimini (Brau et al. 2008), we built four scenarios based on four attributes in order to compare the probability that the representative tourist in Rimini chooses each scenario with the analogous probability for the representative resident.[26] This simulation allowed the identification of differences in the distribution of tourists' and residents' preferences among alternative scenarios, and the identification of the preferred scenarios for residents and for tourists. Moreover, it provided useful information for policy makers aiming at proposing social welfare enhancing tourism projects.

Table 8. Comparison between residents and tourists' best scenarios

Attributes	**Status quo**	**Environment friendly scenario**	**Mass-tourist scenario**	**Resident scenario**
Promenade	vehicles	pedestrians	pedestrians	pedestrians
Overcrowding	high risk	low risk	high risk	high risk
Environment (beach) preservation	low permanent	high	low temporary	medium
Beach by night	close	close	open	open
Choice probabilities				
Residents	8.09%	20.03%	27.39%	44.49%
Tourists	10.20%	15.96%	40.53%	33.31%

In our experiment, different rankings of alternative scenarios clearly emerged (Table 8): whereas the *status quo* was unanimously considered the worst scenario, the best alternative for tourists was the "Mass-tourism scenario", which represented the second best for residents. Vice versa, the local community preferred the "Resident scenario" which was the second choice of tourists. Neither residents nor tourists were really interested in an environmental friendly scenario, probably because it is not in the nature of a mass-tourism destination such Rimini.

[26] It must be recalled that the twin study on tourists slightly differed in the definition and in the levels of the cultural and monetary attributes. For this reason, such attributes were not considered in the simulation, and this might affect the estimated probabilities.

6 Conclusion

During their holidays, tourists produce direct and indirect effects on local residents. These tourism externalities on the local community can either be positive or negative, and in this paper we investigated how residents internalise them. Our case study was Rimini, a popular Italian seaside resort with more than ten million national and foreign overnight stays every summer. We used a stated preference approach and, in particular, a discrete choice modelling technique to test some conjectures about residents' willingness to pay for alternative scenarios regarding the use of the territory. Such approach enabled us to identify potential synergies or trade-off with tourists.

The main results are here summarized: first, residents have strong preferences over the 24-hour a day use of beach services, the pedestrianization of the seaside avenue and a cultural policy focused outside the tourism season. They are less interested in decreasing mobility risks through the project of a coastal train, while they like the present anthropic nature of Rimini's seaside. However, a deeper analysis of resident sub-samples highlights how residents whose jobs are mainly based on tourist flows are less willing to pay for the pedestrianization of the seaside avenue, since this might divert tourists attention away from their activities and tighten local competition.

Second, a comparison of our results with those of the "twin" research on tourists in Rimini (Brau et al. 2008) allowed us to highlight that there is room for potential and strong synergies in the organization of the territory. Both tourists and residents have strong preferences towards beach services open at night and towards the quality of the promenade. Both groups like the present (strong) environmental impact of bathing establishments and fairly "like" overcrowding, so the mobility risk is not at the top of their preferences.

However, there was an important dimension of potential trade-off lying in the model of cultural policy that they want for Rimini. Both groups are willing to pay for an improvement in the cultural policy, but tourists want it during the summer, while residents ask for more cultural events during winter months.

Moreover, we analysed how tourism policy and public investments in the destination might affect residents' welfare. In this respect, the forthcoming project of building a coastal train to reduce mobility risk seemed not to be a top priority in the residents' preferences. The policy implication

is straightforward, since the project of transforming the seaside avenue in a pedestrian area is much more simpler and much less expensive than building a new railway.

Our exercise allowed a rough simulation of what might happen were such policies implemented. Consider the implicit prices of Table 6 and assume that the policy maker were able to charge all residents with an extra tax equal to their willingness to pay; for the pedestrianization of the promenade, residents are willing to pay up to € 20.47 per month; if taxpayers in Rimini are around 100,000, these numbers would lead to an extra revenue of up to € 24 million that could be used both to finance the project and to compensate losers from its implementation. However, residents might easily decide to pass the extra tax burden on tourists, since they are also willing to pay for the pedestrianization of the promenade (see Brau et al. 2008).

To the best of our knowledge, ours was one of the first attempts to check for any synergy and trade-off between tourists and residents' preferences in a mass tourism destination, by applying the choice experiment technique on the local population. In the case of a mature destination such as Rimini, which recently made a great effort to diversify mainly towards business and cultural tourism, further research calls for other choice experiments, this time aimed to uncover preferences of "out of season" (business and cultural) tourists.

References

Akis S, Peristianis N, Warner J (1996) Residents' attitudes to tourism development: the case of Cyprus. Tourism Management 17: 481-494

Alberini A, Rosato, P Zanatta V (2005) Combining actual and contingent behaviour to estimate the value of sport fishing in the lagoon of Venice. Ecological Economics 61(2-3):530-41.

Apostolakis A, Shabbar J (2005) Stated preferences for two Cretan heritage attractions. Annals of Tourism Research 32(4): 985-1005

Bateman IJ, Carson RT, Day B, Hanemann M, Hanley N, Hett T, Jones-Lee M, Loomes G, Mourato S, Ozdemiroglu E, Pearce DW, Sugden R, Swanson J (2002) Economic valuation with stated preference techniques. Edward Elgar, Cheltenham UK

Ben-Akiva M, Lerman S (1985) Discrete choice analysis: theory and application to travel demand. MIT Press, Cambridge MA

Bennett J, Blamey R (eds.) (2001) The choice modelling approach to environmental valuation. Edward Elgar, Cheltenham

Boxall PC, Adamowicz WL (2002) Understanding heterogeneous preferences in random utility models: A latent class approach. Environmental Resource Economic 23: 421-446

Brau R, Cao D (2006) Uncovering the macrostructure of tourists' preferences. A choice experiment analysis of tourism demand to Sardinia, FEEM Working Paper 33/2006

Brau R (2007) Il choice modelling nell'analisi del turismo sostenibile, in Punzo L, Usai S. (eds.) L'estate al mare, McGraw-Hill Italia, Milan.

Brau R, Scorcu AE, Vici L (2008) Assessing visitor satisfaction with tourism rejuvenation policies: the case of Rimini, Italy. Forthcoming in Journal of Environmental Planning and Management.

Breffle W, Morey E (2000) Investigating preference heterogeneity in a repeated discrete-choice recreation demand model of Atlantic salmon fishing. Marine Resource Economics 15: 1-20

Bull A (1991) The economics of travel and tourism. Longman Cheshire, Melbourne

Bunch DS, Louviere JJ, Anderson DA (1996) A Comparison of Experimental Design Strategies for Multinomial Logit Models: The Case of Generic Attributes. Working Paper, Graduate School of Management, University of California, Davis

Candela G, Giannerini S, Scorcu AE (2007) Le caratteristiche strutturali di una destinazione matura. Il caso di Rimini. Economia dei Servizi 1:123-46.

Carson RT (2000) Contingent valuation: a user's guide. Environmental Sciences and Technology 34: 1413-1418

Carson RT, Groves T, List JA, Machina M (2002)Probabilistic Influence and Supplemental Benefits: A field test of the two key assumptions underlying

stated preferences. Working Paper, University of California
Castellani M, Candela G, Dieci R (2007) Il turismo responsabile: un'opportunità per le destinazioni turistiche e per i turisti. Politica Economica 23(1):83-102.
Crotts JC, Holland SM (1993) Objective indicators of the impact of rural tourism development in the state of Florida. Journal of Sustainable Tourism 1: 112-120
Crouch GI, Louviere JJ (2004) The determinants of convention site selection: a logistic choice model from experimental data. Journal of Travel Research 43(2): 118-130
Cummings RG, Taylor LO (1998) Does realism matter in contingent valuation surveys?. Land Economics 74: 203-15
Doxey GV (1975) A causation theory of visitor-resident irritants: methodology and research inferences. Proceedings of the Travel Research Association, 6th annual conference, San Diego, California, pp. 195-198
Dwyer L, Forsyth P (1993) Assessing the benefits and costs of inbound tourism. Annals of Tourism Research 20: 751-768
Faulkner HW, Tideswell C (1997) A framework for monitoring community impacts of tourism. Journal of Sustainable Tourism 5(1): 3-28
Figini P, Troia T (2006) Le caratteristiche dei turisti a Rimini: un confronto tra due recenti indagini. Sistemaeconomico 11(3) :5-20
Figini P, Castellani M, Vici L (2007) Estimating tourist external effects on residents: a choice modelling application to Rimini. FEEM working paper n. 76.07:1-28.
Freeman AM (1993) The measurement of environmental and resource values. Resources for the Future, Washington DC
332–341
Hanley N, Wright R, Koop G (2002) Modelling recreation demand using choice experiments: climbing in Scotland. Environmental and Resource Economics 22: 449-466
Hanley N, Mourato S, Wright R (2001) Choice modelling: a superior alternative for environmental valuation. Journal of Economic Surveys 15: 435-462
Haralambopoulos N, Pizam A (1996) Perceived impacts of tourism: the case of samos. Annals of Tourism Research 23: 503-526.
Hausman J, McFadden D (1984) Specification tests for the multinomial logit model. Econometrica 52: 1219-1240
Hausman J, Wise D (1978) A conditional probit model for qualitative choice: discrete decisions recognizing interdependence and heterogeneous preferences. Econometrica 46: 403-426
Hensher D, Rose J, Greene W (2005) Applied choice analysis: a primer. Cambridge University Press, Cambridge
Huybers T (2005) Destination choice modelling: what's in a name?. Tourism Economics 11(3): 329-350
Huybers T, Bennett J (2000) Impact of the environment on holiday destination choices of prospective UK tourists: implications for Tropical North Queensland. Tourism Economics 6: 21-46
Kessels R, Goos P and Vanderbroek M (2006) A Comparison of Criteria to

Design Efficient Choice Experiments. Journal of Marketing Research 43: 409-419
Lancaster K (1966) A new approach to consumer theory. Journal of Political Economy 74(2): 132-157
Lancaster K (1971) Consumer demand – a new approach. Columbia University Press, New York
Landry CE, List JA (2007) Using ex ante approaches to obtain credible signals of value in contingent markets: evidence from the field. American Journal of Agricultural Economics 89(2): 420-32
Lindberg, K., Andersson TD, Dellaert BGC (2001) Tourism development: assessing social gains and losses, Annals of Tourism Research 28(4): 1010-1030
Lindberg K, Dellaert BGC, Rassing CR (1999) Resident trade-offs. A choice modeling approach. Annals of Tourism Research 26(3):554-69
Lindberg K, Johnson R.L. (1997a) The economic values of tourism's social impacts. Annals of Tourism Research 24: 90-116
Lindberg K, Johnson RL (1997b) Modelling resident attitudes toward tourism. Annals of Tourism Research 24: 402-424
Liu J, Sheldon P, Var T (1987) A cross-national approach to determining resident perceptions of the impact of tourism on the environment. Annals of Tourism Research 14: 17-37
Louviere JJ, Hensher DA, Swait JD (2000) Stated choice methods. Cambridge University Press, Cambridge
Mazzanti M (2003) Discrete choice models and valuation experiments. Journal of Economic Studies 30: 584-604
McFadden D (1974) Conditional logit analysis of qualitative choice behaviour. In: Zarembka P (ed.) Frontiers in econometrics. Academic Press, New York, NY
McFadden D (1984) Econometric analysis of qualitative response models. In: Griliches Z, Intriligator MD (eds.) Handbook of econometrics II. Elsevier Science, Amsterdam, pp 1395-1457
Morey E, Rossmann KG, Chestnut LG, Ragland S (2002) Valuing reduced acid deposition injuries to cultural resources: marble monuments in Washington DC. In: In: Navrud S, Ready RC (eds) Applying environmental valuation techniques to historic buildings, monuments and artifacts. Edward Elgar, Cheltenham, UK
Morrison MD, Bennett JW, Blamey RK, Louviere JJ (1996) A comparison of stated preference techniques for estimating environmental values. Choice Modelling Research Report 1, University College, The University of New South Wales, Canberra
Orsingher C (ed) (2004) Comprendere il turismo nella Provincia di Rimini. Mimeo, Comune di Rimini
Papatheodorou A (2001) Why people travel to different places. Annals of Tourism Research 28(1): 164-179
Pearce DG (1989) Social impacts of tourism. In: Social Cultural and Environmental Impacts of Tourism, NSW Tourism Commission, Sydney, pp.

1-39.
Pizam A, Milman A (1984) The social impacts of tourism. UNEP Industry and Environment 7(1): 11-14
Provencher B, Baerenklau KA, Bishop RC (2002) A finite mixture logit model of recreational angling with serially correlated random utility, American Journal of Agriculture Economics 84 1066-1075
Ryan C (1991) Recreational tourism: a social science perspective. Routledge, London
Scorcu AE, Vici L (2008) Il turismo balneare a Rimini: scenario attuale e possibili evoluzioni nelle preferenze dei turisti. Sistemaeconomico, forthcoming
Thurstone LL (1927) A Law of comparative judgement. Psychological Review 34: 273-286
Train KE (1998) Recreation demand models with taste differences over people. Land Economics 74(2): 230-9
Train, K.,2003. Discrete choice methods with simulation, Cambridge, Cambridge University Press.
Travis AS (1984) Social and cultural aspects of tourism. UNEP Industry and Environment 7(1): 22-24
Wall G, Mathieson A (2005) Tourism: Change, Impacts and Opportunities. Pearson Prentice Hall, Essex, UK
Williams TA (1979) Impact of domestic tourism in host population: the evolution of a model. Tourist Recreation Research 4(1): 15-21
Zanatta V, Rosato P, Alberini A, Reppas D (2005) The impact of speed limits on recreational boating in the lagoon of Venice. FEEM Working Paper 135/05
Zwerina K, Huber J, Kuhfeld WF (1996) A General Method for Constructing Efficient Choice Designs. Working Paper, Fuqua School of Business, Duke University.