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CULTURE SENSITIVE TOURISTS ARE MORE PRICE *IN*SENSTIVE

Abstract

The purpose of this article is to analyze the effect of the cultural interest manifested by tourists when planning a vacation on their sensitivity to price. The proposed hypothesis states that tourist price sensitivity is moderated, at the moment of choosing a destination, by cultural interest. For this purpose, we measure and identify tourists' price sensitivities -individual by individual- from real choices, i.e., tourist price sensitivity is estimated for each individual by observing the destination s/he actually selects. The empirical application is carried out on a sample of 2,127 individuals, and the operative formalization used to estimate individual price sensitivities follows a Random-Coefficient Logit Model; and to detect the way these sensitivities relate to the search for culture, an Anova procedure is employed. The results show an incremental effect of cultural interest on tourist price *in*sensitivity; i.e. people looking for culture find their price sensitivity moderated by this interest in such a way that the negative effect of price diminishes. Also, we further explore these culture-interested tourists by a segmentation analysis, identifying five segments with different price sensitivities -one of them even showing certain *high-price proneness*-.

Key words: tourist sensitivity to price, destination selection, cultural tourist.

1. INTRODUCTION

Cultural tourism is a global trend that has caught the attention of no end of tourists (Chang and Liu, 2009). This type of tourism includes visiting historic or archaeological sites, being involved in community festivals, watching traditional dances or ceremonies, or merely shopping for handcrafted art, among others (Besculides et al, 2002). However, while both traditional and new cultural destinations seek to secure a niche position in the international tourism map (Russo and Van der Borg, 2002), they must not neglect the idea that, ultimately, cultural tourism should consistently contribute to local welfare as an inclusive, spatially balanced and self-supporting industry (Caserta and Russo, 2002), with lots of synergies with other strategic sectors of the urban economy (Russo and Van der Borg, 2002). In this context, public bodies are interested in the analysis of individual choice behavior in order to attain better organization and implementation of their cultural tourism policies, whether they are aimed at revitalizing already consolidated areas or at identifying new opportunities. This ultimately allows them to foment sustainable tourism development and increase social wellbeing through financial income. Moreover, by recognizing the way in which tourists optimize their actions and the circumstances under which they reach this optimum situation, tourism organizations can reproduce them for as many people as possible. In fact, De Rus and León (1997) show that the analysis of vacation choice is of vital importance for both tourism companies and public institutions, insofar as individual tourist decisions act as a guide to their actions. Additionally, tourism companies use the tourist decision making process as a starting point when analyzing demand behavior and, in this way, adjust their supply. Therefore, the success of a given action is determined by knowledge of the factors that affect tourist choice: chief among these factors is pricing, which is crucial to the aforementioned contribution to local welfare and financial income. Concretely, this

is the motivation of this article: whether culture-driven tourists show different price sensitivities from those who are non-culture-driven. Also, among tourists interested in cultural tourism, it is relevant to identify potentially distinct price sensitivities; i.e. segmenting them by their price sensitivities.

The major contribution of this article to the literature is the analysis, for the first time, of the price sensitivities of culture-driven tourists. To this end the study estimates their individual utility function -one by one-. The study of tourist behavior, in particular the way in which they process, evaluate and integrate the information used to make a decision, is traditionally made in two ways. The first is known as the *Revealed Preferences* approach and is based on the analysis of the *real choices* made by individuals (Ben-Akiva and Lerman, 1985). It assumes the existence of *preferences* that are unobservable to the analyst but that tourists implicitly consider when ranking alternatives, and which are only *revealed* through the real purchase choice.. The second approximation examines the ranking or scoring -according to *preferences*- given by individuals to hypothetical choice alternatives (Timmermans and Golledge, 1989; Batsell and Louviere, 1991). In contrast to the first approach, the analyst does not observe the real purchase choice, given that the individual only makes a *declaration of intent* based on his/her preferences (i.e. which alternative would be chosen if he/she had to choose from the given options). This approximation is, therefore, called the *Stated Preferences* approach. However, the latter approach has been widely criticized due the fact that it does not reflect reality in the sense that the declaration of the preferred alternative of an individual does not necessarily coincide with his/her real behaviour, i.e. with the alternative that is actually chosen (Kroes and Sheldon, 1988). To put it plainly, “the destination an individual says he/she would like to go to” is one thing but “the destination that that person really goes to in the end” is another thing altogether.

Conversely, the *Revealed Preferences Approach* obtains tourist preferences through the analyses of their actual choices. However, one of the weak points of the *Revealed Preferences Approach* derives from the fact that the estimation of preferences is made at a global sample level, which does not allow representation of individual level preferences. Of course, the value of this instrument for the decision making of tourism organizations is indubitable, as it allows them to know how people react to changes in destination attributes, but the estimations of their utility functions come from the global sample level, giving rise to an aggregate utility function. This is where this study takes cultural tourist choice a step forward by proposing the estimation of the utility function parameters tourist by tourist, so that we obtain a parameter for each individual (and not for the whole sample). With the advantages of operating with individual utility functions and the fact that no previous application of this procedure in cultural tourism has been found, this research has also segmented this market through the individual revealed preferences of tourists. We base our analysis on a critical dimension: individual price sensitivity.

2. THE EFFECT OF TOURISTS' CULTURAL INTEREST ON THEIR SENSITIVITY TO DESTINATION PRICE

Classical economic theory provides guidelines to the nature of the demand/price relationship, accepting that price and demand are inversely related. However, literature on price emphasizes the importance of different price dimensions, and recognizes the complex role of price in consumer purchasing decision. Erickson and Johansson (1985) state that the role price plays in a consumer's evaluation of product alternatives is very possibly not unidimensional, and distinguish between the reduction of wealth because of high prices (prices as a constraint), and the information on product quality these high prices convey (prices as a product attribute). This multidimensional view on prices leads

to increased awareness of the importance of price implications, since the role of different price dimensions varies between consumers and product types, and recognition that complex pricing schemes may be a necessity for particular situations (Gijsbrechts, 1993). In other words, the measurement of the price effect is not an easy task and a host of complicating factors emerges, such as consumer heterogeneity and the choice context.

In the context of tourism, a markedly heterogeneous market with an enormous diversity of price sensitivities, the role price plays becomes especially complex.. In general, literature holds that demand for tourism products and tourist activities is that of *ordinary goods*, in such a way that price increments diminish consumption (Smith, 1995), meaning that price is a factor that reduces the utility of a destination. At an empirical level, a negative relationship between price and destination choice is found by Morey et al. (1991), Dubin (1998), Train (1998) and Riera (2000) in the case of natural parks; by Haider and Ewing (1990), Morley (1994a; 1994b) and Eymann and Ronning (1992) for countries (administrative units) and by Siderelis and Moore (1998) for macro-destinations. However, another line of thought proposes that price does not have a dissuasive effect on destination choice, but that price is an attraction factor. Morrison (1996) indicates that the underlying hedonistic character often found in the consumption of tourism products implies that high prices do not always act against demand; rather that the concept of value for money, which compares the amount spent with the quality of amenities and service, takes over (Morrison, 1996).

In this respect, a compelling aspect within the framework of tourism destination choice is to examine the effect that a tourist's cultural interest may exert on his/her sensitivity to destination price. In other words, is it possible to assume that cultural interest has a moderating role in the effect of price sensitivity on destination choice?

The underlying logic is that tourist motivations can become the main generators of utility when visiting destinations: tourists spend more or less depending on their wishes at a specific time. Accordingly, the effect of price on destination choice could change depending on the interest of the tourist. The theory of consumer behavior considers that motivations represent individual internal forces that lead to action (Schiffman and Kanuk, 2007). In this respect, tourist motivations are characteristics of individuals that influence destination choice as they act as push factors leading to the realization of tourist travel (Moutinho, 1987; Sirakaya, 1992; Gartner, 1993; Sirakaya et al., 1996; Kim and Lee, 2002). It is important to stress that the selection of a certain vacation destination implies a desire for some kind of benefit. Because of this, motivations play a fundamental role in destination choice, as they constitute internal thoughts which lead tourist behavior towards certain ends (Nahab, 1975); in other words, they are the reasons why people take a vacation (Santos, 1983; Richards, 2002)).

Regarding the interest *"*search for culture", Rugg (1973) assumes that a stay in a destination over a period of time allows for the enjoyment of its cultural attributes (Rugg, 1973: p.65) and that the tourist obtains utility from this. Bearing in mind this consideration, and the fact that the motivations and interests to go on vacation are determinants of the valuation of attributes (price) and of the choice of destination (Eymann and Ronning, 1997), we can expect that people who choose a destination for its cultural character have a greater propensity to pay higher prices -they are less sensitive to price- if they receive these attributes in return. Therefore, we propose the following hypothesis:

H.1: *The search for culture when selecting a destination moderates price sensitivity, in such a way that the tourist is prepared to pay higher prices.*

3. RESEARCH DESIGN

3.1. Methodology

As a new contribution to research, the proposed methodology allows us to estimate and explain individual sensitivities based on real travel decisions. It consists of two stages: i) estimation of individual price sensitivities through a Logit Model with Random Coefficients; and ii) application of the Analysis of Variance (Anova).

Stage I: Individual price sensitivities

To estimate the individual parameters (price sensitivities) of a Random Coefficients Logit Model (RCL) we apply Bayesian estimation methods in the context of destination choice. We use the RCL Model because of: i) its ability to deal with the unobserved heterogeneity of tourists, by assuming that the coefficients of the variables vary among tourists; and ii) its flexibility, which allows representation of different correlation patterns among alternatives. Thus, following the formal approach of Train (2003), the utility function U_{in} of alternative i for individual n is defined as

$$U_{in} = \beta_n price_i + \varepsilon_{in} \quad (1)$$

where $price_i$ is the price of i; β_n is the parameter of price for each individual n which represents personal sensitivity; i.e. it allows us to identify the tourist sensitivity to the attribute "price"; and ε_{in} is a random term that is independently and identically distributed extreme value. The likelihood of the observed choice i for individual n conditional on β is expressed as

$$P(i/price_i,\beta) = \frac{\exp\{\beta_n price_i\}}{\sum_{j=1}^{J} \exp\{\beta_n price_j\}} \quad (2)$$

This specification of the RCL model allows coefficients β_l to vary over decision makers with density $g(\beta)$). Note that it differs from the traditional Multinomial Logit model on β, since in this model, β is fixed and does not vary over decision makers. Stemming from expression (2), since we do not know β_n, the probability of a person's choice is the integral of the previous expression over the distribution of β:

$$P(i / price_i, \theta) = \int P(i / price_i, \beta) g(\beta / \theta) d\beta \quad (3)$$

Note that $g(\beta/\theta)$ is the distribution of the random parameter vector β in the whole population, and θ are the parameters of this distribution (mean and variance). We can derive the distribution of the sensitivities of people selecting alternative i, $h(\beta/i,p_n,\theta)$, by applying Bayes' rule (see the Appendix for the specifications of the Bayesian technique applied to this empirical application):

$$h(\beta / i, price_i, \theta) \cdot P(i / price_i, \theta) = P(i / price_i, \beta) \cdot g(\beta / \theta) \quad (4)$$

And re-arranging,

$$h(\beta / i, price_i, \theta) = \frac{P(i / price_i, \beta) g(\beta / \theta)}{P(i / price_i, \theta)} \quad (5)$$

Therefore, we can obtain the price sensitivity β_n of individual n through the expression

$$\overline{\beta}_n = \int \beta \cdot h(\beta / i, price_i, \theta) = \int \frac{\beta \cdot P(i / price_i, \beta) g(\beta / \theta) d\beta}{P(i / price_i, \theta)} = \frac{\int \beta \cdot P(i / price_i, \beta) g(\beta / \theta) d\beta}{\int P(i / price_i, \beta) g(\beta / \theta) d\beta} \quad (6)$$

Stage II: Anova

To analyze the influence of culture interest on individual sensitivity to price we rely on the Analysis of Variance (Anova), which allows for the identification of significant differences between groups of people that select their destination according to distinct interests.

3.2. Sample, Data and Variables

To reach our proposed objective, we use information on tourist choice behavior obtained from a publicly available national survey carried out by the Spanish Center for Sociological Research[1]. This is due to the following reasons: i) The availability of information on individual destination choice behavior; and ii) The survey is directed at a sample (over 18 years old) obtained in origin, which avoids the characteristic selection bias of destination collected samples, leading to a more precise analysis of tourism demand. The sample is taken by using multistage sampling, stratified by conglomerations, with proportional selection of primary units -cities- and of secondary units -censorial sections-. The information was collected through personal, at home, interviews with a structured questionnaire. The sample size is of 2,127 people that take vacations in domestic destinations, whose average household size is 3.52, traveling with 0.82 children under 16, with a proportion of 64.08% of married people, of average age 42.25, 21.64% staying at hotels and spending about 645.48€ on vacations.

In order to make the choice model operative, we define the variables used and identify the dependent and independent variables.1) *Dependent variable.* To represent the destination chosen by the individual, we use fifty dummy variables for the fifty Spanish provinces.

[1] The items in the questionnaire appear in www.cis.es/cis/opencms/EN/index.html

2) *Independent variable for the choice model: Destination Price*. Regarding its measurement, authors such as Eymann & Ronning (1992) and Usach (1999) consider that the correct method of reflecting the price of a certain tourist market is to compare destination prices with those of the home market and those of competing destinations. Along this line, Eymann & Ronning (1992) use purchase parity differentials between the origin and respective destinations, obtained from the corresponding consumer price indexes. Also, Morley (1994c) demonstrates that the Consumer Price Index (CPI) of a geographical region is a good indicator of tourist prices, by showing high correlation between the two. In line with these authors, our study measures destination prices of intra-country administrative units through consumer price index differentials among origins and destinations. The base year is 1995 and these indices are published by the National Institute of Statistics (INE) and represent the cost of living of each origin/destination[2]. The use of this variable implies the construction of an origin-destination matrix of a 50x50 order; i.e. we have to gauge as many differences in CPI as the number of provinces minus one, resulting in a 50x50 matrix with zeros in its diagonal.

3) *Cultural interest when planning a vacation*. The measurement of motivations and interests is not simple as it involves analyzing internal aspects of the individual. These psychographic factors are fundamental characteristics to properly configure vacation products as they provide a global description of the cognitive structure of the individual, but they are not widely used in the literature of choice as they are not directly observable by the analyst, who would have to make additional effort in the collection of information through databases and VALS (*Value and Life Styles*), LOV (*List of Values*) or AIO (*Activities, Interests and Opinions*) studies (Plog 1994).

[2] The way the INE calculates the CPI can be found at http://www.ine.es/en/daco/daco43/meto_res_ipc_en.htm.

However, certain one-dimensional indicators, which are also known as primary dimensions or life style parameters (Bigné et al. 2000; Lehmann, 1989), allow the capture, as proxies, of the internal aspects of the individual. Along these lines, interest in culture when planning a vacation is measured through a dummy variable, where the value of one means that the individual considers this interest when selecting a destination, and zero otherwise (McIntosh and Goeldner, 1984; Eymann and Ronning, 1997).

4. RESULTS

Firstly, we employ Bayesian procedures to estimate the coefficients (sensitivities) of the variable "price" for each individual, using Random Coefficients Logit Models (Stage I of the Methodology). The mean effect of price, which represents the preferences of an average individual is as follows: "Price" shows a parameter equal to -0.2100 (standard error=0.0203) and a standard deviation standing at 0.0809 (standard error=0.0209), both mean and standard deviation being significant at a level below 0.001. This leads us to characterize "price" as dissuasive factor in the choice of destination. However, it is important to stress that the variance parameter of the coefficient (SD(β)) is significant, which implies that "price" has a differentiated effect among the sample individuals and thus, a given high price does not suppose the same reduction in utility for all the sample tourists. The differentiated effect found for "price" suggests that there is a great diversity of sensitivities in the tourist market.

Once the individual sensitivities to price are estimated, they are used in the Anova procedure to see whether individuals with cultural interest have different price sensitivities (Stage II of the Methodology). Table 1 shows that people who consider this interest when choosing a destination become less price sensitive; i.e., they are more predisposed to go to a more expensive destination provided they can access its culture.

Thus, hypothesis 1 is confirmed in that this cultural interest moderates price sensitivity with regard to destination choice, in such a way that the tourist is prepared to pay higher prices -they are more insensitive to price-, in line with Rugg (1973) and Eymann and Ronning (1997).

As significant differences have been obtained, we are going to further explore the price sensitivity of people with an interest in culture when planning their vacations. We have shown that they are less affected by prices than those that do not express this interest but, within the culture interested group, how disperse or heterogeneous are their sensitivities?

To illustrate this point and the utility of obtaining estimations of individual preferences we select two tourists from the sample (for example, sample observations 340 and 1938) to compare their preference structures with the average culture-interested tourist (Table 2). Note that we are just extracting two price sensitivities for two culture-interested people obtained when estimating individual parameters in Stage I of the Methodology (from formula 6). Tourist 340 shows a positive marginal utility in relation to prices (higher than the average tourist) and tourist 1938 a negative one (more negative than average). Figure 1 shows graphically how disperse these preferences can become. This illustration with two observations shows the importance of knowing the individual preferences of each tourist, as in this way, tailor made cultural tourist products can be offered, giving rise to a one by one or tourist by tourist segmentation.

Looking more deeply into the heterogeneity in price sensitivity of tourists showing cultural interest, we apply Ward's cluster method to the matrix of the estimations of the individual parameters in order to find segments within the culture driven group. The Ward Algorithm is used to form hierarchical groups of mutually exclusive subsets (Ward, 1963). Given a number *n* of sets, this algorithm reduces them

to n - 1 mutually exclusive sets by taking into account the union of all possible n(n - 1)/2 pairs and choosing the union that has the maximum value for the objective function. In short, this procedure seeks to minimize the sum of squares of any two potential clusters that can be formed at each stage. In the opinion of Grande and Abascal (2007) and Gené (2002), this is the most appropriate method when using variables derived from previous statistical procedures, and Sorensen (2003) indicates that this method is regarded as very efficient.

To obtain the optimum number of segments, we apply Lewis and Thomas's (1990) double explanation criteria of a minimum of 65% of the total variance, and of at least 5% increase in variance when adding a new segment, we detect five segments. Table 3 summarizes the results of the application of both criteria; the shaded area represents the number of segments selected according to these criteria: with five segments, the model explains 94.574% of the variance and the addition of the fifth segment implies an increase of 5.426% in the variance explained. Note that adding a new segment would raise it 3.461% which is less than 5%. Thus, five segments is the optimum.

However, in order to confirm that these five segments are really different, we apply an Anova to their price sensitivities. We find that the segments identified are significantly distinct at a level of 0.1% with regard to the value obtained from the *F* test in the Anova (see Table 4). This reaffirms the existence of differences in the preference structures of individuals who manifest a cultural interest[3]. Figure 2 shows graphically the dispersion in price sensitivity of these culture-interested segments.

[3] Also, the Scheffé test blindly arrives at the conclusion that each and every segment is statistically significantly different, not only globally but to one another regarding their price sensitivity.

All segments are high-price averse except segment 5, which shows certain *high-price proneness* (see Table 4). The most sensitive segments are 2 and 4 whose sensitivities are above average tourist levels. They represent about 49% of culture-interested tourists. Another 45.7% is due to two segments (1 and 4) which, in spite of producing negative sensitivities, are more insensitive to prices than average. Surprisingly enough, we find segment 5 shows a positive parameter (5.30%): these culture interested people interested are willing to pay extra money to get the attribute they expect to obtain.

Once we have identified and described the five segments, the "who are they?" and "how do they behave?" questions emerge. We use four demographics for the first question: i) Household size, measured by the number of people living in the house; ii) Children under 16, the number of children under sixteen who go on vacation; iii) Marital status, a dummy variable is used where married=1 and single=0; and iv) Age, a quantitative variable is used to represent the age of the individual. For the second question, we employ two behavioral variables: i) Accommodation hotel type, measured by a dummy variable with value 1 if the tourist stayed in a hotel and 0 otherwise; and ii) level of expenditures, measured as a quantitative variable which represents costs incurred during the vacation.

According to these aspects, let's characterize each segment with their most salient features (Table 5): Segment 1, comprised of people who are somewhat insensitive to prices (their average price sensitivity is -0.1107 (see Table 4), which is lower (in absolute terms) than the global average=-0.192 (see Table 2)), shows the largest proportion of married people (67.60%). Segment 2, formed by the most price sensitive people (with an average price sensitivity equal to -0.2976), presents the largest number of children under sixteen and the lowest proportion of people staying in a hotel

(20.50%). Segment 3, which occupies an intermediate position regarding price sensitivity (-0.1721), shows the smallest household size. Segment 4, which is the second most price averse (-0.2280), presents the lowest proportion of married people and is the youngest segment. Segment 5, with its *in*sensitivity to prices (its parameter is even positive, 0.0116), has the lowest number of children under sixteen traveling with them, is the oldest group, presents the largest percentage of people staying in a hotel, and is by far the segment with the largest vacation expenditures (1101.86€).

At this point, it is important to note that, when it comes to tourist behavior in destinations, one the most critical variables is level of expenditure as it is a key element in the analysis of tourism returns in a destination and in the formulation of strategies and policies: a destination may decide to design marketing strategies which will attract "quality tourists", who will spend more during their stay, as opposed to attracting numerous tourists with less intention to spend. For the five segments, the magnitudes found for expenditures are statistically different by employing an Anova test ($F=3.134$; $p<0.05$). By applying the Scheffé test, we find that Segment 5 is notably different from the rest, meaning that these more insensitive, older people, not only tend to stay in hotels, but are prone to spend more money. Figure 3 depicts this relationship between price sensitivity and expenditures for each culture-interested segment.

5. CONCLUSIONS

Literature suggests that the effect of price on destination choice can be either positive or negative, and interests are stated to be an important determinant of tourist decisions. In this respect, the aim of this study is to analyze the relationship between a culture-driven interest and tourist price sensitivity. For this purpose, we measure and identify tourists' price sensitivities -individual by individual- from *real choices* made by tourists in order to facilitate realism, i.e., tourist price sensitivity is estimated for each

individual by observing the destination s/he actually selects. The operative formalization used to estimate the individual price sensitivities follows a Random-Coefficient Logit Model and to detect the effect of the interest proposed, an Anova procedure is applied. With the advantages of operating with individual utility functions and the fact that no previous application of this procedure in cultural tourism has been found, this research has also segmented this market through the individual revealed preferences of tourists.

The empirical application carried out on the sample of 2,127 individuals reaches the following conclusion: cultural interest moderates tourist sensitivity to price in such a way that its presence helps reduce the negative effect of price; that is, tourists driven by this interest become less sensitive to price. Also, we have found five culture-interested segments with significantly different price sensitivities.

As managerial implications, the following can be mentioned: given that the existence of diversity of sensitivities to price is confirmed for the culture-interested tourist market, an important implication is that, knowing the tourist by tourist preference structure in terms of price response allows managers to find and "build" an appropriate destination for each individual (though extreme, it could be possible). It also facilitates the formation of segments with similar "price preferences". Note that the analysis is based on the preferences of individual people, and preferences are key elements in the choice of destinations. Moreover, the estimation of the individual parameters of the utility function of each individual reveals his/her preference structure and allows the analyst to operate with precise information on each individual. At a time when tourists are becoming increasingly demanding and insisting on service provision adapted to their specific needs, knowledge of the profile of each individual allows tourist organizations to offer the most suitable products. Identifying individuals with

more or less sensitivity to the price of destinations, with a specific emphasis on their capability to provide the tourist access to culture, is crucial for destination managers. In this way they can, first, know their clientele in terms of preferences, second, develop appropriate products with the right attributes, third, set "fair" prices (without incurring opportunity costs) and fourth, design promotional campaigns directed at the targeted group with emphasis on the appropriate traits.

Among the limitations of this study are the following: i) its static character, as it is only based on the main annual vacation of an individual (the survey was not repeated over the years). Alternatively, an analysis of all vacations taken (main vacation, weekend trips etc.) in a year or over various years with panel data would allow us a better understanding of the determinants of choice, the accuracy of sensitivities could be improved and observation of the temporal evolution of the effects of the prices; ii) the field of study is domestic tourism in Spain. It would be useful if the results were tested in an international framework.

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Appendix. Applying the Bayesian procedure to this empirical application

Following Train (2003), the likelihood L of observed choice y_n for an individual n conditional on parameters b and W (average and variance of β_n, respectively) is expressed as:

$$L(y_n / b, W) = \frac{e^{X_n \beta_n}}{\sum_{j=1}^{J} e^{X_n \beta_n}} \phi(\beta_n / b, W)$$

where ϕ is the function of Normal distribution.

Let $k(b,W)$ be the prior distribution of parameters b and W. In general, it is assumed that b has a Normal distribution and W an Inverted Gamma distribution (or Inverted Wishart distribution in the case of multi-variation) of type $f(W)=W^{-(v+1)/2}e^{-vs/2W}$ with v being the degrees of freedom and s a parameter of scale to be estimated. Bayes' rule allows the analyst to obtain the posterior distribution $K(b,W,\beta_n/Y)$ for the group of choices Y of the sample individuals (n=1,..., N) as:

$$K(b, W, \beta_n / Y) \propto \prod_{n=1}^{N} L(y_n / b, W) k(b, W)$$

The posterior distribution has three parameter types to estimate $\theta=\{b,W,\beta_n\}$: the average b, the variance W, and the parameters of each individual β_n, from which we obtain the conditional indirect utility functions of each individual and, therefore, the preference structure. The estimation of the parameters is obtained through the following expression

$$\hat{\theta} = \int_{\theta} \theta \cdot K(\theta / Y) d\theta$$

This integral has no closed solution, which leads the researcher to use a procedure of estimation by simulation. Therefore, θ is estimated as the average of the simulated drawings. However, the posterior distribution $K(\theta/Y)$ does not always take the

form of a known distribution from which one could immediately take draws. Train (2001a), in the case of choice models, suggests the use of Monte Carlo Markov Chains; specifically, the sample simulation algorithms of Gibbs and Metropolis-Hasting for the draws of the density function (the parameter estimates for the model are based on 14,000 draws obtained after discarding the first 4,000 iterations (which are used for burn-in) and the prior values for parameters comes from the maximum likelihood sample estimates). Train (2001b) also demonstrates that the estimator of the simulated average of the posterior distribution is consistent, asymptomatically normal and equivalent to the estimator of maximum likelihood.

Table 1
Relationship between culture interest and tourist sensitivity to price

	Mean sensitivity to price
Group interested in culture	-0.1920
Group not interested in culture	-0.2098
F-*statistic*	6.381[a]

a=prob<5%

Table 2. Illustration of individual preferences

	Culture-interested tourists' sensitivity
Culture-interested tourist 340	0.013
Culture-interested tourist 1938	-0.330
Average Culture-interested tourist	-0.192

Table 3. Segments based on price sensitivity

N. of Segments	σ^2*	σ^2(%)*	$\Delta\sigma^2$*	Explained Variance
10	0.010	0.935	0.374	99.065
9	0.014	1.310	0.374	98.690
8	0.018	1.684	0.561	98.316
7	0.024	2.245	1.216	97.755
6	0.037	3.461	1.964	96.539
5	0.058	5.426	5.332	94.574
4	0.115	10.758	9.074	89.242
3	0.212	19.832	20.486	80.168
2	0.431	40.318	59.682	59.682
1	1.069	100.000	0.000	0

*Intra-group variance.

Table 4. Descriptives for the five segments

Segment	Average price sensitivity	Percentage of tourists
1	-0.1107	22.52%
2	-0.2976	23.18%
3	-0.1721	23.18%
4	-0.2280	25.83%
5	0.0116	5.30%
Anova (F-statistic)	641.08*	

*=prob<0.1%. The Scheffé Test shows that each and every one of the five segments are statistically different.

Table 5. Characterization of culture-interested segments

	Household size	Children under 16	Married	Age	Hotel	Expenditures
Segment 1	3.588	0.607	67.60%	40,26	40.60%	412.29 €
Segment 2	3.911	1.548	60.00%	40,48	20.50%	443.82 €
Segment 3	3.114	0.437	42.80%	36,48	40.60%	552.36 €
Segment 4	3.324	0.735	41.00%	35,76	38.40%	411.36 €
Segment 5	3.250	0.285	62.50%	47,87	83.30%	1101.86 €
Average	3.466	0.803	52.90%	38,68	37.00%	487.28 €

Figure 1. Individual preferences

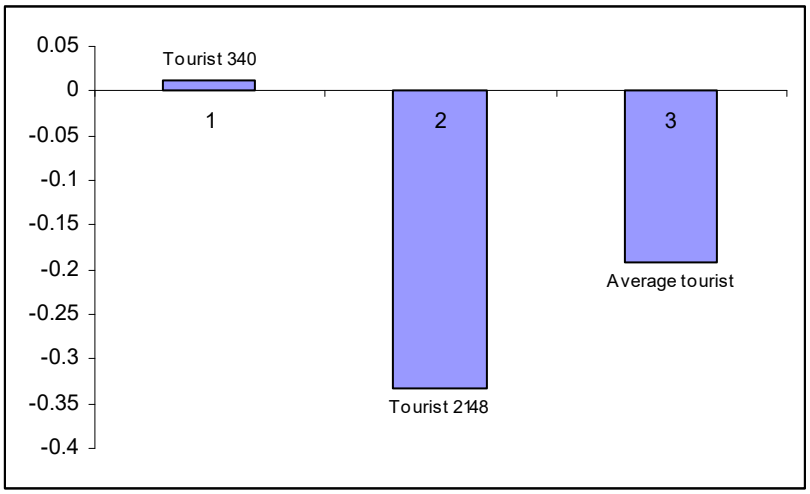

Figure 2. Cultural segments' price sensitivity

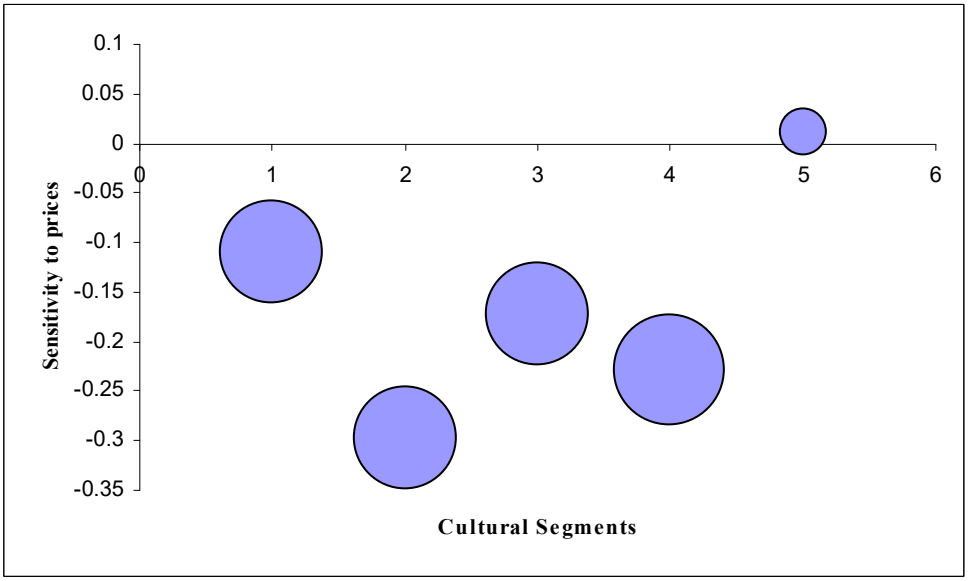

Figure 3. Relationship price sensitivity and expenditures