Journal of Air Transport Management 17 (2011) 168–174

Contents lists available at ScienceDirect

Journal of Air Transport Management

journal homepage: www.elsevier.com/locate/jairtraman

Nationality and low-cost trip duration. A microeconometric analysis

Josep Maria Raya-Vilchez [a,*], Esther Martínez-Garcia [b]

[a] Escola Universitaria del Maresme (Universitat Pompeu Fabra), C/Passeig del callao, s/n, 08301 Mataro, Barcelona, Spain
[b] Department of Economics, Universitat de Girona, C/Alemanys, 4, 17071 Girona, Spain

Keywords:
Air travel and tourism
Spanish tourism
Low-cost airlines and tourists

A B S T R A C T

This study examines the determinants of trip duration of international tourism using low-cost carrier services from the UK, Germany, France and Italy; top tourist emitting countries in the EU. Data is from a survey conducted for one of the largest low-cost carriers tourist markets; the Girona–Catalonia region in Spain. A model of traveller/tourist demand is estimated using an econometric duration model. It is found that that while there are some common effects for associated with the four nationalities of tourist, some differences exist relating to such things as age or education.

1. Introduction

Tourists travelling on low-cost airlines (LCCs) in Europe have increased sharply, in contrast to the stagnation of traditional companies. Regional governments and the tourist industry supporting LCC in their territories are increasingly interested in knowing what type of tourists LCC are attracting and their behaviour. One aspect of consumer behaviours that is receiving attention by policy-makers involves the determinants of tourists' length of stay at a destination, trip duration being a key elements in a tourist's decision-making process and important for the economies of destination regions. Tourist products at destinations have to be tailored to the length of time a tourist has available with the tourist industry usually preferring longer stays because of lower administration costs and potentially higher per day expenditures by the tourists.

We analyses the factors that affect trip duration of LCC tourists going to Spain: the personal characteristics of the low-cost tourist, the nature of the trip and stay, and the characteristics of the destination. To this end a model is developed that distinguishes between tourists from four of the top tourist emitting countries in Europe; the UK, Italy, Germany and France.

2. The model

Economic analysis of tourism demand is generally grounded in neoclassical theories of consumer choice with demand measured as a quantitative variable, such as in the case of duration. Given the characteristic of the duration choice, a time restriction is also included. With this model, tourism demand does not differ in its specification from the demand for other goods and services. In the more stylized formulation of the model, tourist demand is the result of a standard maximization process by the tourist/consumer, of a utility function, the arguments for which are the consumption of tourism and other goods, conditioned by a budgetary restriction, given by the prices of the non-tourism and tourism-related goods and consumer income, and a time restriction, which is determined by the tourist's possibilities of assigning the time available for tourism and non-tourism consumption.

That is, the consumer/tourist chooses $n=(n_1,\ldots n_n)$ the number of days to stay, together with q, consumption of all of the other goods, as a result of a conditioned maximization process of a utility function of the tourist/consumer. Conditions or restrictions are budgetary and time restrictions. The optimization of the tourist's utility function may be expressed as[1]

$$\text{Max. } U(n;q)-\mu_1[(C+p_n n)+q-Y]-\mu_2(n+\text{Tr}+\text{tq}-T) \qquad (1)$$

where C is the exogenous cost of transport, p_n is the monetary cost per day of stay, Y is the consumer's income, Tr is the time spent travelling, T is the time available for consumption (tourist and non-tourist), and tq is the time dedicated to non-tourist consumption. The budgetary restriction $(C+p_n n+q\leq Y)$ indicates the spending capacity of the tourist on other goods (q) and on tourism (n). In the latter case, expenditure is given by transport costs (C) plus costs at destination $(p_n n)$. The time restriction $(n+\text{Tr}+\text{tq}\leq T)$ indicates the possibility of assigning time available to the consumption of other goods (tq) and tourism, the latter distributed between time dedicated to travel (Tr) and time at destination (n).

* Corresponding author.
E-mail address: josep.raya@upf.edu (J.M. Raya-Vilchez).

[1] For simplicity, the sub-indices relating to each individual have been eliminated.

0969-6997/$ – see front matter © 2010 Elsevier Ltd. All rights reserved.
doi:10.1016/j.jairtraman.2010.12.005

The demand functions for other goods (q) and tourism (n) are obtained from the optimization. Assuming that the utility function satisfies the standard properties of the neoclassical consumer choice model, and that preferences for the consumption of tourism and other goods are weakly separable[2], then the demand function for tourism length of stay for the individual i is

$$n_i = n_i(p_n, C, \mathrm{Tr}, Y, T) \quad (2)$$

From the conventional theory represented by the above model it is expected that price per day of stay will have a negative effect on demand ($\partial n/\partial p_n$), and that income ($\partial n/\partial Y$) and time available ($\partial n/\partial T$) will have a positive effect.

In addition, a series of explanatory variables (X) are included to reflect with the heterogeneity of a tourist's preferences. The random term (e) represents the effects unexplained by the explanatory variables included in the model. The demand function (n, number of day) to be estimated for each individual i will be

$$n_i = n(p_{n_i}, C_i, \mathrm{Tr}_i, Y_i, T_i, X_i, e_i) \quad (3)$$

The non-normal distribution of the stochastic component of the function to be estimated makes estimation of a linear function by ordinary least square inadvisable (Kieffer, 1988). Furthermore, all observations of the dependent variable are positive and the information for the dependent variable and explanatory variables is only for the time of stay at a destination. Hazard, also called duration or survival, econometric models, is also beginning to be used in the field of tourism. These models are used when time is the variable of interest to the researcher. They treat the dependent variable (duration) as a continuous variable, use specific distribution functions for it which take into account its positive nature, and allow any duration to be taken into account. With these it is possible to estimate the factors that determine how long an individual is in one state before he or she makes the transition to another state (Cameron and Trivedi, 2005). In fact, these models allow the modelling of both duration (in our case, the time the tourist is at destination) and the probability of transition (leaving the destination), conditioned to survival up to the moment t. It is also possible to estimate whether the duration is correlated to variables or regressors which would be the observed explanatory variables of duration and would correspond with the aforementioned economic model of tourism demand.

There are different duration models, all of which model a survival function (the hazard function) (Jenkins, 2005). The survival function can be increasing or decreasing, monotonic or nonmonotonic, continuous or discontinuous. Most parametric models can be split into two groups: proportional hazard function models (PM) and accelerated failure time models (AM). In the PM, the hazard function (probability of failure) comprises two components: the baseline hazard (which is only a function of "t") and the explanatory variables or covariate function, which will be different depending on the model (Weibull, Exponential, Gompertz).

Empirical estimations are more common with PM than AM due to the fact that the parameters that affect the covariates can be consistently estimated without specifying the functional form for the baseline hazard, as in proportional hazard models the effects of the parameters multiply the hazard. This is due to the fact that in the PM the effects of the parameters multiply the risk, which in turn simplifies the analysis. The implications of this are that if, for example, the destination chosen by the tourist is a covariate of the model and halves the hazard rate at time 0, it will also halve the hazard rate at time 1 and at any other time, that is for any value of t. In this case, Kaplan–Meier's prior nonparametric estimation of the survival function should result, for any value of the covariate, in a graph with parallel curves. Fig. 1 shows the survival function graph for the three destinations (1: Girona; 2: Barcelona; 3: Beach destination). From the diagram it can be observed that the proportionality hypothesis does not seem to be plausible in this case. Furthermore, the Schoenfeld test of residuals confirms this result, rejecting the null hypothesis of proportionality in the hazard function, the value of the statistic being 72.58, which, given the 19 degrees[3] of freedom, leads to a p-value of 0.

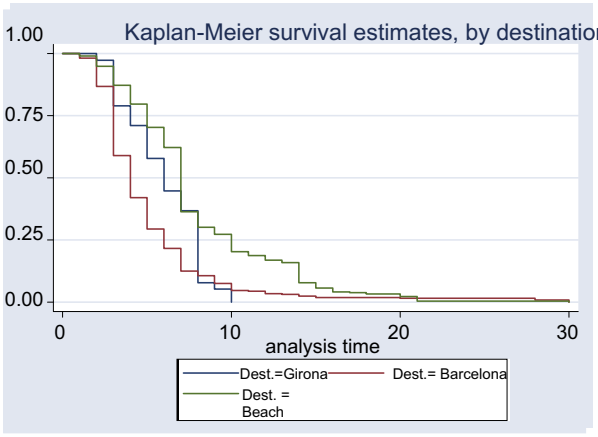

Fig. 1. The Kaplan–Meier survival function by destination.

Bearing in mind the fact that the hypothesis of proportionality is not fulfilled in our case, proportional hazard models are rejected in favour of accelerated failure time models. In the specific distribution functions which give rise to AM (Exponential, Weibull, Log-normal, Log-logistic and Gamma), the logarithm of "t" is expressed as a linear function of the explanatory variables and a density function of the errors established according to the specific distribution function. As noted by Cameron and Trivedi (2005), consistent parameter estimates are dependent on specification of the correct model, so that to choose the appropriate model for the data, misspecification tests are to be used.

To do this, and in order to be able to choose the correct model, specification tests for the different functional forms were carried out. Specifically, when the models are nested, as in the case of the Log-normal and Weibull models in the Gamma model, in which the k parameter of the Gamma function is zero and one, a Wald test allows to choose between the two. With our data there is not sufficient evidence to reject the Log-normal model (although there is enough to reject the Weibull model as the parameter k, at 95% of confidence, is between −0.038 and 0.45[4]). To discriminate between un-nested models (Log-normal, Gamma and Log-logistic), the criteria of the logarithm of the likelihood function and the AIC criterion are used. The model which is finally estimated is that of the Log-logistic distribution function for duration, as this is the one which has the highest value for the logarithm of the likelihood function (−364.02) and a lower value in the AIC criterion[5] (770.04).

[2] This hypothesis simplifies the analysis, as it allows estimations to be made without taking into account the whole range of information that would otherwise be required and that is generally not available, as in our case. In fact, only the information relating to decisions on the consumption of tourism is required, regardless of decisions on other types of consumption.

[3] All of the calculations in this section aimed at obtaining the most correct specification were performed using a joint model for all of the nationalities studied.

[4] Furthermore, the exponential model as nested in the Weibull model (a specific case in which the parameter of the Weibull distribution function $\alpha = 1$) is rejected as said parameter is, with a 95% level of confidence, between 1.96 and 2.26.

[5] The values of the likelihood function and the AIC criterion for the rest of the specifications are as follows: Cox (−2690.49; 5422.48); exponential (−576.53; 1193.46); Gompertz (−489.80; 11021.60); Weibull (−396.88; 835.76); Log-normal (−371.68; 785.36); Gamma (−369.40; 782.80).

In fact, in duration studies with AM, this is one of the most frequently used specifications. The Log-logistic distribution function, which is nonmonotonic, is also coherent with the risk function of the dependent variable (duration of trip) observed in the Kaplan–Meier estimation in Fig. 2.

To be specific, the form of the cumulative distribution function (H) corresponding to the Log-logistic model, and which represents the likelihood that the length of a trip by a tourist (T) is lower than the specific value "t" is

$$H(t) = \Pr(T \le t) = 1 + (\lambda t)^{1/\gamma} \quad \gamma > 0, \ \lambda = \exp(-x_j\beta) \tag{4}$$

where x is the covariate for the hazard of the j tourist and β is the parameter. The survival function, that is, the likelihood that the length of the tourist's trip is greater than "t" periods, is

$$S(t) = \Pr(T > t) = 1/(1 + (\lambda t)^{\gamma}) \tag{5}$$

the density function $f(t)$ of the duration variable being

$$f(t) = \frac{\lambda^{1/\gamma} t^{[(1-\gamma)/\gamma]}}{\left[\gamma(1 + (\lambda t)^{1/\gamma})\right]^2} \tag{6}$$

and therefore the hazard function ($h(t)$) which represents the conditional probability that a tourist ends the trip at the moment "t" conditioned to having already spent "t" periods is

$$h(t) = \frac{\lambda^{1/\gamma} t^{((1-\gamma)/\gamma)}}{\gamma(1 + (\lambda t)^{1/\gamma})} \tag{7}$$

The effect of "t" on the hazard function is nonmonotonic, increasing first with "t" and then decreasing monotonically if $\gamma < 1$. It will be monotonically decreasing if $\gamma > 1$.

3. Data and results

The data used in this study are taken from passenger traffic at Girona airport. Our duration model uses information taken from a survey conducted in the spring and summer (peak season) of 2005. The survey was administered to foreign tourists who stayed in Catalonia and used low-cost airlines to go to Catalonia and then to return home. The information was acquired during the tourists' return journey, making it possible to obtain information relating to the personal characteristics of the tourists and their trip and stay. The interview was administered in the airport building, after passport control and while passengers were waiting for the flight to leave.

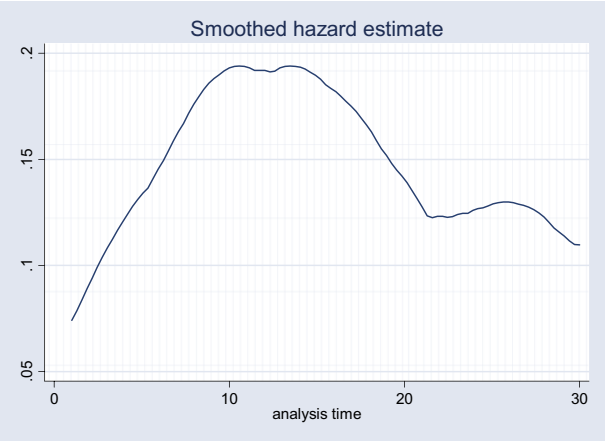

Fig. 2. Estimates of Kaplan–Meier risk.

The dependent variable, number of days stayed (n in the model), is considered to be continuous and takes values from 1 to 31 days. The explanatory variables used in the model were chosen according to the economic model described in Section 2 above, and as it is usual in applied economic studies of demand, constrained by the availability of information from the sample of the individuals interviewed.

Those variables are sociodemographic characteristics of the tourist (level of education, gender, age, working or not), the type of accommodation chosen, the main reason for travel, whether or not the trip was done during summer, the destination (two city destinations – Girona, which is an average-sized city, and Barcelona, which is a large city – and coastal "sun and sand" destinations); and whether or not it was an organized trip. All of these are categorical variables; for the purposes of the model estimation as many fictitious variables were created for each categorical variable as there were categories for each variable. One of the categories for each variable acts as a reference category. The results of the model estimation will show the effect of each category of the explanatory variable on the likelihood of length of stay with regard to the reference category.

As it is a generally common practice in most of the economic analysis of demand, and duration in particular, sociodemographic characteristics and main reason for travel are included to capture heterogeneity in tourists' preferences. The variable type of accommodation chosen is employed as a proxy of the monetary cost of stay. Generally, staying at a hotel has a higher price per day than that of rented apartments, free accommodation (own accommodation or that of friends or family), tourist campsites and other cheaper forms of accommodation. Furthermore, a higher category of hotel is generally associated with a higher price. The time restriction is represented by the time when the trip is made (off-season or during the summer, in the middle of the holiday period for most tourists, when the availability of time for tourism is generally greater). Finally, the variable destination is capturing different type of destination specialization or tourist products: urban tourism (in the case of cities) and sun and sand tourism (in the case of coastal resorts).

The expected results from the estimation of the empirical model are according to the theoretical model: heterogeneity in preferences among LCC tourists is to be observed, time and income constrains are relevant for duration, and the effects of each explanatory variable can differ among tourists according to their country of origin. For example, Martínez-Garcia and Raya (2008) and in Pestana Barros et al. (2009) the nationality of tourists was found significant for heterogeneity among tourists. In Gokovali et al. (2007) income and those that did not travel with a fully organized trip were more likely to stay longer, and in Pestana Barros and Pinto Machado (2010) the type of destination was significant. The specific results obtained by the empirical studies on duration such as the above mentioned ones, may differ, among other reasons, because estimations are made for different regions, time periods and tourist types or markets. However, statistical significance of variables representing the effects of time and income constraints, individual heterogeneity and nationality as determinants of duration is commonly observed.

Some variables may include different effects. Therefore results are going to be commented accordingly. For example, having a paid job is expected to have a positive effect on demand (because of having higher available income). However, it could also generate a negative effect if it implies having less free time to travel.

The descriptive statistics are shown in Table 1. The first column displays the distribution of the sample by variables and categories of interest, and the second displays average duration. Most tourists in the sample were aged under 55, had a paid job, were travelling on holiday, had not bought a tourist package-type trip, opted to stay

Table 1
Descriptive statistics.

Variables	UK		France		Italy		Germany	
	Frequency	Length	Frequency	Length	Frequency	Length	Frequency	Length
Age (ref: <55)	0.865	6.35	0.875	7.33	1	5.17	0.914	7.40
Age > 55	0.135	9.18	0.125	8.83	0	–	0.086	10.60
Gender (ref: woman)	0.550	6.87	0.490	7.98	0.534	4.85	0.448	6.90
Man	0.450	6.55	0.510	7.08	0.466	5.54	0.552	8.31
Occupation (ref: employed)	0.775	6.55	0.667	7.39	0.660	4.97	0.629	7.16
Retired and student	0.225	7.35	0.333	7.78	0.340	5.57	0.371	8.55
Education (ref: university education)	0.380	6.05	0.740	7.14	0.573	4.95	0.353	7.15
Primary or secondary	0.620	7.15	0.260	8.60	0.427	5.47	0.647	7.97
Marital status (ref: single)	0.320	5.33	0.469	8.20	0.641	5.38	0.534	7.38
Married	0.680	7.39	0.531	6.92	0.359	4.81	0.466	8.02
Reason (ref: other)	0.070	4.43	0.104	9.50	0.194	4.70	0.164	9.63
Holiday	0.930	6.90	0.896	7.29	0.806	5.29	0.836	7.29
Type of accommodation (ref: hotel 4 or 5 star)	0.215	5.74	0.104	5.60	0.155	4.50	0.103	6.50
Hotel 3 star	0.380	6.29	0.208	6.90	0.252	5.38	0.250	5.68
Hotel 1 or 2 star	0.075	5.13	0.208	4.80	0.243	5.38	0.138	5.13
Campsite	0.075	12.6	0.063	7.00	0.010	13.00	0.043	14.20
Rented house/apartment	0.090	8.27	0.083	13.13	0.107	5.27	0.129	9.66
Own house	0.165	6.24	0.333	8.90	0.233	5.42	0.336	8.97
Package (ref: no)	0.685	6.55	0.938	7.52	0.903	5.27	0.897	7.93
Yes	0.315	7.13	0.063	7.50	0.097	4.30	0.103	5.50
Travelling (ref: not alone)	0.935	6.88	0.823	7.49	0.845	5.31	0.819	7.77
Alone	0.065	4.46	0.177	7.65	0.155	4.44	0.181	7.28
Season (ref: spring)	0.500	5.48	0.552	6.00	0.505	4.09	0.440	6.15
Summer	0.500	7.98	0.448	9.40	0.495	6.27	0.560	8.87
Area (ref: sun and sand)	0.770	7.63	0.458	9.90	0.262	6.70	0.690	8.68
Girona	0.040	5.00	0.073	5.86	0.039	5.50	0.017	5.50
Barcelona	0.190	3.42	0.469	5.44	0.699	4.58	0.293	5.44

at hotels and also own accommodation, and travelled with other people. Most British and Germans chose "sun and sand" destinations; the Italians mainly preferred Barcelona, and the French were distributed more or less equally between sun and sand destinations and urban destinations. The average observed stay was relatively short, the longest being where the chosen form of accommodation was camping (for the British, Italians and Germans, with 12.6, 13 and 14.2 days) or renting a home (for the French, with 13.13 days).

3.1. Results

Before commenting on the results obtained, it should be point out that in the model there are no problems with data censoring in the duration variable, as we have all of the information available throughout the whole period under analysis (that is, the entire stay at destination). Furthermore, it is supposed that the covariates are time-invariant during the period of analysis. Also the estimations display a negligible value of unobserved individual heterogeneity (which may be caused, for example, by the income variable being absent from the data) as the estimations hardly vary when taking heterogeneity into account and p-values for the likelihood ratio test approach unity, therefore accepting the null hypothesis of absence of unobserved heterogeneity. In addition, standard errors have been estimated robustly given that, with person-period data, the assumed homoscedasticity is very questionable.

Detailed results of the estimation of the model are presented in Table 2. Given the functional form and the value of $\gamma < 1$[6], the risk value increases by t up to a specific time (around 8 days for all countries except Italy, which is around six days) when it starts to drop, as can be observed in Fig. 3. The results of the duration model estimation may be interpreted in two ways: as the effect of the covariates on the conditioned probability of the trip ending; or as the effect of the covariates on the expected value of a tourist's trip duration. Therefore, if a variable positively affects the conditioned probability that a tourist ends the trip, it will negatively affect the expected value of trip duration. In Table 2, a positive sign of the estimated coefficients indicates an increase in the survival probability or duration of the trip.

The results show how each of the explanatory variables had a different effect on the probability of risk or on the number of days of survival (trip duration). What is more, common effects are observed for all of the countries analyzed, as well as some different effects. Thus, the following were not significant for any tourist country of origin[7]: gender, reason for travelling, whether it was a package trip or not, travelling alone or in company. By contrast, travelling in the summer as opposed to spring was significant and had a positive effect on trip duration for all of the countries analyzed. It is also worth highlighting the significant and negative effect on trip duration of travelling to an urban destination as opposed to "sun and sand" type destination, except in the case of the Italian tourists, for whom no significant effect was found.

For other characteristics relating to the tourist and trip, effects differ according to country of origin. Thus, for British tourists, being over 55 reduced trip duration when a level of significance of 10% was considered. This is similar for marital status, which was significant at 10% of significance but not at 5%, and trip duration increasing for those who are married, though only for British tourists; whilst the same can be said of not having a university

[6] Values within the interval 0.22–0.29. Specifically: 0.29 (France), 0.25 (Germany), 0.24 (UK) and 0.22 (Italy).

[7] The hypothesis of the variable being zero could not be rejected.

Table 2
Log-logistic regression results by country of origin.

Variables	France	Italy	Germany	UK
Age (ref: <55)				
Age > 55	−0.202*	−0.032	–	−0.000
Gender (ref: woman)				
Man	−0.051	−0.136	0.120	0.170
Occupation (ref: employed)				
Retired and Student	0.056	0.123	0.094	0.298**
Education (ref: university education)				
Primary or Secondary	0.075	0.197	0.147*	0.047
Marital status (ref: single)				
Married	0.154*	−0.057	−0.116	0.103
Reason (ref: other)				
Holiday	0.414	−0.100	0.152	−0.061
Type of accommodation (ref: hotel 4 or 5 star)				
Hotel 3 star	−0.080	0.016	−0.039	−0.174
Hotel 1 or 2 star	0.109	0.009	−0.024	−0.121
Campsite	0.490**	0.043	0.603**	0.524**
Rented house/apartment	0.187	0.811**	0.095	0.262
Own house	0.048	0.497**	0.135	0.187
Package (ref: no)				
Yes	0.062	0.074	0.008	−0.214
Travelling (ref: not alone)				
Alone	0.096	0.014	−0.031	−0.239
Season (ref: spring)				
Summer	0.216**	0.492**	0.398**	0.239**
Area (ref: sun and sand)				
Girona	−0.185	−0.392**	−0.028	−0.598**
Barcelona	−0.596**	−0.436**	−0.156	−0.529**
Constant	1.358	1.676	1.168	1.722

*p-Value: <0.10 and >0.05; **p-value: <0.05.

education in the case of Italian tourists. Being retired (as opposed to being employed) increased survival in the case of the Germans. Type of accommodation was significant and had a positive effect on duration in the case of camping type for British, Italian and German tourists; whilst for French tourists it was free accommodation (own homes or those of family or friends) and rented housing that had a positive and significant effect. No statistically significant differences were detected in length of stay between different categories of hotels for any of the tourist groups.

In summary, the following had a positive and significant effect on length of stay for the British: being married, staying at a campsite and travelling in summer. Whilst being an older tourist and choosing the urban destination of Barcelona had a negative and significant effect. By contrast, for French tourists the type of accommodation generating a significantly longer stay was own home or rented housing, and no significant effects were detected for age or marital status. For Italian tourists, as with the British and Germans, the type of accommodation that had a positive and statistically significant effect was the campsite, while the same effect was witnessed for Italians for travelling in summer and to a sun and sand destination. The Italians are also the only group for whom level of education was significant. Lastly, the German tourist is differentiated from the others by the fact that not being employed significantly increased average stay. To sum up, and in relation to those variables which were statistically significant, length of stay was increased by the following: for the British, travelling in summer rather than spring, being married (at a level of significance of 10%), being under 55 (also at a level of significance of 10%), staying at a campsite and choosing a coastal tourist destination rather than an urban one; for the French, travelling in summer, staying in free or rented housing, and staying at a coastal destination as opposed to an urban one; for the Italians,

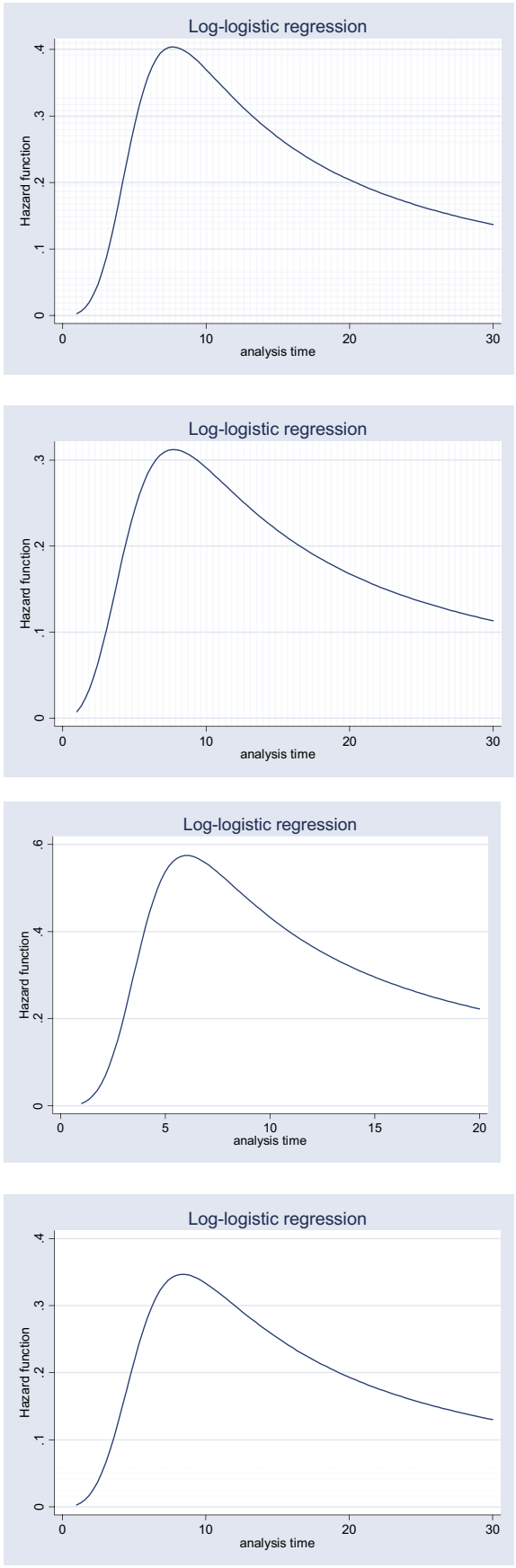

Fig. 3. Hazard functions (top to bottom; UK, France, Italy, Germany).

travelling in summer, not having a university qualification (at a level of significance of 10%) and staying at a campsite; for the Germans, travelling in summer, not being employed, staying at a campsite and choosing a coastal tourist destination rather than an urban one.

The results suggest that for all tourists time restriction has a clear effect on length of stay, this being significantly longer during the holiday period, which is when most consumers have more time to travel. The results also point to the significant effect of the cost of the trip, meaning that the length of the trip may act as an adjustment variable where the cost or price of the trip is higher. Therefore, the greater the cost, the shorter the trip, as would seem to be indicated by the fact stays at lower cost establishments are significantly longer, although with some different effects according to country of origin of the tourist. No clear relation appears, however, between the socio-economic level of the tourist and length of stay. This is probably because no significant differential effects are detected for the tourist's level of education[8], and because the fact of currently being employed (working as opposed to being retired or a student) does not seem to have any significant effect (except for the Germans, in the case of whom not working increases the probability of survival). However, a higher level of education does not necessarily correlate positively to a higher income. What is more, being employed and therefore earning an income may include very heterogeneous realities with regard to levels of income; and it may even also include the effect of a greater time restriction.

With regard to other variables introduced in the model to represent the effect of the heterogeneity of preferences, the estimated models do not generally offer any significantly different information regarding preferences according to the gender of tourists, their age or marital status (except for the latter two variables in the case of the British and for a level of significance of 10%), travelling alone or accompanied, or travelling on an organized trip.

For policy-making purposes, the quantitative effect of each category of variable on length of stay. To this end, average length of stay is presented in Table 3, according to the estimated model, and for the variables which were statistically significant for each country of origin of the tourist. Thus, it can be seen that the estimated average length of the trip is relatively similar for the British (6.27 days), the Germans (6.93 days) and the French (6.70 days), but slightly less for the Italians (4.74 days). The quantitative effects of each variable are different for each country of origin of the tourist, however. Thus, for example, in the case of the Germans, travelling in summer increases average stay by 2.5 days (from 5.5 to 8.0), while the increase for the Italians is 2.2 days (from 3.6 to 5.8). The quantitatively higher effects are observed for period of travel (summer versus spring), and type of accommodation. Thus, travelling in summer rather than spring increases the average predicted time by between 2 and 3.5 days: 3.40 days for the French; 2.57 days for the Germans, 2.19 days for the British and 2.2 days for the Italians. With regard to type of accommodation: staying at a four or five-star hotel and also staying at a campsite increases length of trip by between five and none days for tourists from the UK (5.53 days), Italy (8.66 days) and Germany (8.65 days). Staying in a rented apartment (5.83 days) or accommodation belonging to friends or family members (3.08 days) also significantly increases the predicted time in the case of the French.

Location also appears a relevant effect. Thus, staying in Girona or Barcelona, both urban destinations, as opposed at a sun and sand location reduces the predicted time by around three days (2.96 and 3.45 days) in the case of the German tourist and by between three and four days (2.94 and 4.12 days) in the case of the French tourist. Similarly, for tourists from the UK the reduction of the predicted time if the chosen location is Barcelona compared to a coastal location is 3.97 days. The other observed effects are all between one and two days: being employed or not for Germans, marital status and age for UK tourists, and level of education for Italians.

Table 3
Estimated duration by country of origin.

Variables	UK	France	Italy	Germany
Age (ref: <55)	8.289			
Age > 55	5.954			
Occupation (ref: employed)				6.475
Retired and student				7.715
Education (ref: university education)			4.411	
Primary or secondary			5.187	
Marital status (ref: single)	5.152			
Married	6.795			
Type of accommodation (ref: hotel 4 or 5 star)	5.332	5.321	4.231	5.283
Hotel 3 star	5.896	5.239	4.676	5.462
Hotel 1 or 2 star	4.865	4.404	4.591	4.916
Campsite	10.867	6.457	13.000	13.932
Rented house/apartment	7.822	11.154	4.916	8.239
Own house	6.053	8.409	4.888	7.967
Season (ref: spring)	5.174	5.177	3.683	5.550
Summer	7.365	8.575	5.822	8.020
Area (ref: sun and sand)	7.119	8.848		7.997
Girona	4.762	5.907		5.035
Barcelona	3.143	4.721		4.546
Mean	6.269	6.699	4.743	6.934

In this respect, minimum and maximum length of stay for each country of origin of the tourist, the estimated model would generate the following profiles: in the case of the British tourist, the minimum length profile (2.52 days) would correspond to a single tourist, with a university education, travelling in spring to an eminently urban tourist destination (Barcelona), and choosing a type of accommodation other than campsite. By contrast, the profile corresponding to maximum length of stay (11.99 days) would be a married person, with pre-university education, staying on a campsite at a coastal destination in the summer. For the French tourist, the minimum length profile (3.82 days) corresponds to a tourist travelling in spring to an urban destination, and choosing a type of accommodation other than the home of family members or friends. The maximum profile (16.63 days) corresponds to someone who travels in summer to a beach destination and stays at the house of family members or friends. In the case of the Italian tourist, the minimum length profile (3.55 days) is that of an individual with a university education, aged over 55, travelling in spring and not choosing a campsite for accommodation. The maximum profile (13 days) is that of a tourist with no university education, who stays at a campsite in the summer. Lastly, for the Germans, the minimum length profile (2.71 days) is that of a female tourist, employed, travelling in spring to an urban destination and staying at hotels with a maximum of 3 stars. The maximum length profile (12.2 days) corresponds to a male tourist, retired, travelling in the summer to a beach destination, and who does not choose a hotel with fewer than 4 stars[9].

[8] Except for Italian tourists and at a level of significance of 10%.

[9] It is possible to calculate the probability associated to an expected average duration and a given level of confidence. For example, the case of the maximum length profile for the German tourist, in which the expected duration is 12.2 days, there is a 95% likelihood that the trip lasts between 10 and 14 days.

4. Conclusions

This study examined the microeconomic factors affecting the length of stay of international tourist who use LCCs. Results show that in general time and income restrictions are relevant factors and we found individual heterogeneity. The model shows that those with a longer trip duration are non-senior, married (or live as a couple), British, tourists who travel in the summer to a coastal destination and stay at campsites. The French travel to sun and sand locations in the summer and also stay at campsites. German tourists also choose to travel to a sun and sand location in the summer, they are senior, and choose to stay at a campsite as well. Finally, regarding Italian tourist, longer stays are positively and significantly associated to not being employed, travelling in summer to a sun and sand location and staying at campsites.

Concerning accommodation, in the case of the French a significant and positive effect on trip duration was observed for free accommodation and rented accommodation, while for the other three countries the significant and positive effect was for campsites. The type of destination (sun and sand or urban) was non-significant only in the case of the Italians; and being retired or a student had a positive and significant effect only for German tourists.

In contrast, similar effects, no matter the origin of the tourist, were obtained in the number of instances. Time restriction acts in all cases as predicted by the economic demand model. Longer trip duration is observed in the summer season, when most tourists have more time to travel. The budget constraint is also relevant in all cases: cheaper accommodation (e.g. campsites, rented accommodation and own accommodation) generates longer stays. Even though being employed or not and the level of education have been included in the analysis, they can only be taken as relative proxies of income level (a component of the budget restriction). Urban destinations generally generate shorter stays compared to "sun and sand" destinations. It is also worth mentioning that heterogeneity among tourists is observed. However the purpose of the trip (holidays, visits to family and friends, culture and shopping), as well as some personal characteristics that may shape individual's preferences (age, gender and marital status), are not generally significant factors of trip duration.

References

Cameron, A.C., Trivedi, P.K., 2005. Microeconometrics. Methods and Applications. Cambridge University Press, New York.
Gokovali, U., Bahar, O, Kozak, M, 2007. Determinants of length of stay: a practical use of survival analysis. Tourism Management 28, 736–746.
Jenkins, S.F., 2005. Survival analysis. Lecture notes (draft book), pdf archive in. http://www.iser.essex.ac.uk/teaching/degree/stephenj/ec968/.
Kieffer, N., 1988. Economic duration data and hazard functions. Journal of Economic Literature 26, 646–667.
Martínez-Garcia, E., Raya, J.M., 2008. Length of stay for low cost tourism. Tourism Management 29, 1064–1075.
Pestana Barros, C.P., Butler, R., Correia, A., 2009. The length of stay of golf tourism: a survival analysis. Tourism Management 31, 13–21.
Pestana Barros, C.P., Pinto Machado, L., 2010. The length of stay in tourism. Annals of Tourism Research 37 (3), 692–706.