DOES LOW-COST TRAVEL IMPLY HIGHER TOURISM EXPENDITURE AT THE DESTINATION?

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Abstract (Summary)

Las aerolíneas de bajo coste han aumentado su presencia en los últimos años, disminuyendo así las tarifas aéreas promedio para que los turistas puedan viajar con más frecuencia, obtener un ahorro neto o gastar más en los destinos. Como este último argumento aún no ha sido probado, este trabajo persigue poner a prueba la siguiente hipótesis: "el ahorro de viajes de bajo costo de origen se transfieren, al menos parcialmente, a un mayor gasto turístico en el destino". Un sistema de ecuaciones simultáneas distinguiendo entre el gasto turístico en el origen y en el destino permite abordar esta situación. Los resultados muestran que la hipótesis es verdadera, si bien las tasas de transferencia de ahorro varían con cada perfil del turista que oscila entre 4,1% y 49,8%.

Low-cost carriers have increased their presence during the last years thereby decreasing average air fares so that tourists may travel more frequently, obtain net savings or spend additionally at the destinations. As the latter argument has not yet been tested, this paper pursues to test the following hypothesis: “Low-cost travel savings from origin are transferred, at least partially, to higher tourism expenditure at the destination”. A system of simultaneous equations is estimated using the 3SLS method, distinguishing between tourism expenditure at the origin and at the destination. The results show that the hypothesis is true, whereas the savings transfer rates vary with each tourist profile, ranging between 4.1% and 49.8%.

Palabras clave: Gasto; Bajo coste; Ecuaciones Simultáneas

Keywords: Expenditure; Low cost; Simultaneous equations.

CV-resumido:

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1. INTRODUCTION

One key for success in the tourism sector as an economic growth generator is the capacity to provide added value. Amongst other aspects, tourism expenditure is an essential factor to measure the gross added value of tourism destinations. However, tourism expenditure is not only disbursed at the destination but also in the country of residence. Such decomposition is not trivial in terms of added value. For instance, tour operators located at origin are an open door for channeling tourists while at the same time, they also detract, as deserved, part of the potential added value of the destination. Generally speaking, the result of the negotiations between tour operators and hotel management determines the share of the added value between the origin country and the destination. Arguments against the tour operators' empowerment are usually stated by hotel management as well as local government.

Nevertheless, the tourism market structure has changed and it keeps changing dramatically. Traditionally, most tourists opted for comprehensive packages which were paid for in travel agencies. The advent of Internet has shortened the 'distance' between origins and destinations which has opened up new alternatives to the tourists, allowing for more customized services. There has been a shift towards breaking down tourism packages, such that travel, accommodation, meals, or excursions can be booked separately. Under this new market structure, tourism service products can be distributed either by direct sales on the internet or by cheaper internet intermediaries.

However, it should be noted that this success depends on tourists' confidence in the system. Production costs of tourist products arranged on the internet are likely to decrease. It implies lower prices and or higher profits depending on market competition. In any case, lower prices increase consumer surplus and higher profits increase producer surplus, so that social welfare rises. Moreover, a lower price implies an increase in the number of tourists, even when such price decrease is homogeneous for all destinations because it can generate additional traffic from tourists who, under lower prices, can afford travelling. Hence, added value at the destination is expected to increase either due to a higher number of tourists or due to higher profits.

Controversial discussions have arisen concerning the convenience of the new market structure. Special attention has been focused on the presence of low-cost carriers (LCCs), which have boosted recently as a result of the new situation. Tourism destination policymakers wonder about the consequences for the whole market and the best strategy to deal with them. The consequences are multiple. First, the presence of LCCs may attract new tourists to the destination because they are able to afford travelling at lower prices. Such competitiveness gain is more or less effective depending on how alternative destinations are also dealing with it. Second, the airline market is also affected by LCC entrance. Flagship companies are likely to lose market share and they may even stop flying to the destination at all. All this could affect the share of the profile of the tourists at the destination. Such market share redistribution has an impact on tourism expenditure at the destination. Third, tourists usually face two kinds of constraints for holiday taking. Tourists may spend a limited amount of money on holidays, which represents a tourism budget constraint. Both constraints are key elements for understanding tourism destination choice. The tourism budget constraint is distributed among travelling, accommodation, meals and other expenditure. It is interesting to explore how the presence of LCCs may contribute to a redistribution of such budget. Household savings from cheaper travel tickets may be transferred, fully or partially to higher tourism expenditure at the destination. Testing and quantifying this hypothesis is the purpose of this paper:

Hypothesis:

> *Low-cost travel savings from the origin are transferred, at least partially, to higher tourism expenditure at the destination.*

Testing this hypothesis is relevant to understand one key impact of the presence of LCCs on tourism markets. Quantifying such impact is relevant for policymaking, especially to understand the degree of support that LCCs should receive by destinations. Current literature has focused on the traffic generated by LCCs as well as the market share redistribution, yet it has not dealt with added value redistribution between origin and destination. This paper explores such relationship. The dichotomy between expenditure at origin and destination and their reciprocal relations and causality permits the analysis of these hypothetical situations fostered by LCCs. One methodology that is able to estimate this relationship is a Simultaneous System of Equations. Amongst some alternative models considered, the one estimated by Three Stages Least Squares (3SLS) has been chosen.

2. LITERATURE REVIEW

2.1 Main consequences of the presence of LCCs at a destination

The literature with regards to LCCs has been more focused on the transportation sector. Nonetheless, and at least from a tourism sector perspective, some mutually related questions arise as soon as LCCs are taken into consideration: Have the presence of LCCs increased the flow of tourism to a destination? Have LCCs passengers got different preferences/profiles with respect to the traditional carrier passengers? Are LCCs passengers' savings at the origin transferred to higher tourism expenditure at the destination? The latest research inquiry has not yet been explored sufficiently.

2.2 Have LCCs increased the flow of tourism?

The presence of LCCs travelling to destinations may increase the flow of tourists. However its success depends on many factors. Some key determinants are the coexistence of similar routes, the connectivity of the destination airport with the tourist destination, the behaviour of competing destinations with regards to the presence of LCCs and the sensitivity of the passengers to lower fares together with passengers' willingness to accept LCCs service quality. Obviously, the answer to this question varies with each case study. For this reason, it is not surprising that the literature shows a wide range of results in this sense.

CAA (2006) conducted a report concerning LCCs in the UK. It concludes that there is no plausible evidence of an increase in the flow of passengers due to LCCs beyond the natural stationary growth in the sector. However, the report shows little evidence of an increase in the traffic flow of some routes in comparison with the usual traffic flow of these routes. Nevertheless, in general, the report concludes that LCCs have succeeded in increasing their market share rather than increasing new passengers flow. Young and Whang (2011) differ from the previous report and affirm that LCCs stimulated new demand to the tourist island of Jeju in South Korea. Graham and Dennis (2010) remark that the flow of tourists to Malta has increased due to LCCs. Rey, Myro and Galera (2011) state that, on average, a 10% increase in the number of visitors travelling with LCCs, increases the average number of tourists travelling from EU-15 countries to Spain by a 0.2%. According to Davison and Ryley (2010), LCCs have increased the demand for short breaks from regional airports such as the East Midlands region in the UK to cultural destinations for instance Prague or Berlin, whereas destinations like Faro

or Alicante remain as week-long holidays. In the case of Australia, Forsyth (2003) concludes that the entrance of LCCs have had little impact on the transport sector and thus, on the flow of tourists. Finally, Pulina and Cortés-Jiménez (2010) conclude that LCCs have boosted the tourism demand in Alghero (Italy) in the last decade.

2.3 Have LCC passengers got a different behaviour with respect to traditional carrier passengers?

After any LCC entrance at a destination, according to their behaviour, there may be three sets of tourists: a) new tourists who fly due to the presence of LCCs, b) current tourists who are willing to accept the trade-off between lower prices and new air transport service quality and c) current tourists who keep booking with non-LCCs. Such different behaviour may also be correlated with their budget constraint and it may have an impact on their tourism expenditure at the destination. O´Connell and Williams (2005) affirm that LCC passengers focus their decision on price whereas, traditional carrier passengers take into account a wider set of attributes to make their decision such as reliability, quality, flight schedules, connections, frequent flyer programmes and comfort. According to Mason (2005), the advent of internet and low cost airlines are the main factors behind the change in demand of these two traveller profiles. On the one hand, leisure travellers are taking holidays more frequently but with shorter stays. On the other hand, business travellers are also shifting towards LCCs, especially on short-haul routes. According to Donzelli (2010) LCCs are reducing the seasonality in Southern Italy.
Additionally, LCCs may have provided new opportunities to travel during off-peak periods or to undertake short-break holidays. Again, the nature of the destination and its dependence on the climatic conditions for attracting tourists make a difference on this issue. Thus, different answers are expected to be obtained for different destinations. Young and Whang (2011) conclude that LCCs have no influence on changing seasonal pattern. According to them, LCCs have just overtaken the preexisting schedule flights to the island. On the contrary, Pulina and Cortés-Jiménez (2010) state that LCCs have changed the seasonal pattern of foreign tourists whereas national tourists (Italians) have not changed their preferences and they keep travelling to the island in August, mainly.

2.4 Are LCCs passengers' savings at the origin transferred to higher tourism expenditure at the destination?

So far, there has not been any kind of research carried out concerning this issue. As commented above, this paper is the first one to explore it. However, research on expenditure modelling has been more prolonged.

2.5 Tourism expenditure modelling

Household tourism expenditure is conditioned by several previous decisions. Among these, the decision of whether to travel or not is key to model the tourism expenditure avoiding potential biased results (Eugenio-Martin, 2003). Hageman (1981) represents a pioneer study on this issue, followed up by Van Soest and Kooreman (1987) and Melenberg and Van Soest (1996). A system of equations also provides a suitable framework to model tourism decisions beyond econometric issues such as endogeneity (Mak, Moncur and Yonamine, 1977) or correlation. Alternatively, The AIDS (Almost Ideal Demand System) is also a functional form widely used in a system of equations context. Such functional form is adopted by Coenen and Van Eekeren (2003) or Divisekera (2010). The purpose is the understanding of the expenditure distribution

within the destination. It should be noted that a few papers have distinguished between the tourism expenditure in origin and destination (Aguiló and Juaneda, 2000; Alegre and Pou, 2008; Alegre, Cladera and Sard, 2011). However, none of them have considered such dichotomy for the purposes of this paper.

3. METHODOLOGY

3.1 Application

The methodology is applied to the Canary Islands (Spain), which is an ideal destination for tourism research because arrivals and departures are well documented since air travel is the main mean of transportation to the islands. Additionally, the Instituto Canario de Estadística (ISTAC) provides a very good set of surveys that describe the tourism sector appropriately. Every term, ISTAC conducts a large Tourist Expenditure Survey, which is the basis of the dataset used in this paper.
According to ISTAC time series data, low-cost travelling to the Canary Islands has increased over the last ten years. For instance, in 2006Q1, the share of low cost travelling represented 19.88%. In 2012Q1, it reached 29.50% and in 2014Q1, it increased up to 38.53%. These figures reveal that the presence of LCCs represents an important share of the current market that seems to keep growing. It proves that the market structure has changed and it is still changing.

3.1.2 Dataset

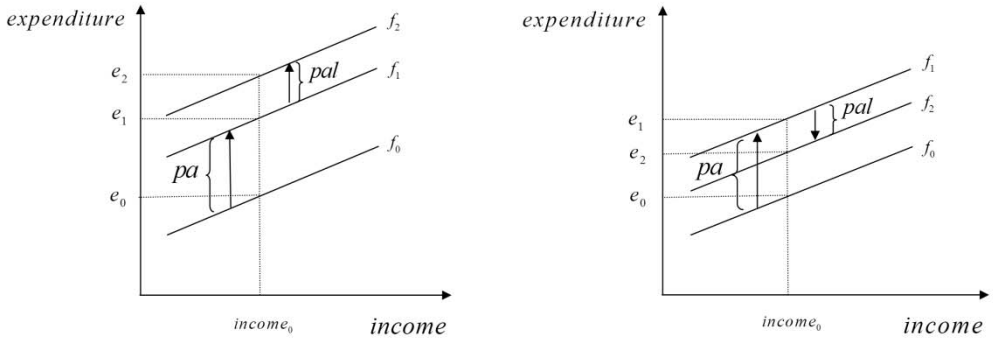
The period chosen for the dataset starts in 2009 and it finishes in the second term of 2011. The survey is a cross section study that includes questions related with expenditure at origin and destination, socio-economic attributes, motivations for choosing the Canary Islands, impression about the holidays, length of stay or previous visits to the islands, among other variables that are explained below. It should be noted that not all the passengers that travel to the Canary Islands are 'true' tourists, because some of them are foreigners that reside in the islands. In order to avoid potential biases in terms of the length of stay or expenditure at the destination, only passengers who stay a maximum of thirty one nights are finally considered. Thus, the dataset is comprised of 53,608 observations.

3.1.3 Variables

During the research of this paper, many variables and alternative specification models were considered. Final endogenous and exogenous variables that are estimated in the model are shown below:
Endogenous variables: *Exporigin* (Expenditure at origin per person and night), *expdestination* (Expenditure at destination per person and night).
Exogenous variables: *income* (yearly income divided by 12 months), *term* (term), *year* (year), *p* (kind of tourist package: flight, flight + accommodation, flight + accommodation + Breakfast, flight + accommodation + half board, flight + accommodation + full board + flight + accommodation + all inclusive), *a* (category of accommodation: 5* hotel, 4* hotel, 3*, 2* or 1* hotel, apartment, house of friends or relatives, others (e.g. timesharing), *pa* (multiplicative dummy between package and category of accommodation), *pal* (*pa* multiplied by a low cost dummy), *destination* (island visited: La Palma, El Hierro, Tenerife, Gran Canaria, Fuerteventura and Lanzarote), *party* (it has got members with age lower than 2 years, between 2 and 12, between 13 and 65 years, older than 65 years), *people* (alone, with couple, with family,

friends and relative or coworkers), *motivation* (main reason for travelling to the Canary Islands: climate, beaches, landscape, environmental quality, quietness, active tourism, health tourism, theme park, golf, other sports, nightlife, shopping, new place, ease of travelling, prices, for kids), and *previous visits* (from 1 to more than 10 times).
The dummy variable *pa* allow the model to estimate a shift from the constant term and capture how much higher or lower such constant term shifts if the tourists are travelling with different package holidays or accommodation. The significance of these dummy variables can be tested, and consequently, the hypothesis of heterogeneous behavior between different tourist profiles may be refuted. Once each shift is estimated, an additional shift that distinguishes if the tourist is travelling with LCCs or not may be incorporated (denoted by *pal*). Such shift represents the isolated effect of travelling with LCCs (see Figure 1). It can also be tested and hence, the hypothesis of different tourism expenditure can also be refuted and quantified.

Figure 1: effect of *pa* and *pal* in tourism expenditure



3.2 Simultaneous equations model

A simultaneous equations model provides a suitable framework to model the dichotomy and mutual relationship between expenditure at origin and expenditure at destination.

3.2.1 Testing Endogeneity, Contemporary correlations between error terms and Heteroskedasticity

Durbin-Wu-Hausmann test is conducted to prove the presence of endogeneity between both endogenous variables. The existence of endogeneity is not rejected. The second step is to check contemporary correlation between the error terms of the two equations. Two approaches are calculated. First, both equations are estimated by OLS but considering only all the exogenous variables of their respective equations. Second, the correlation of the residuals of the two equations are calculated (correlation=0.1537). An alternative to this process might be to estimate a SUR model, where the endogenous variables are excluded as explanatory variables from other equations as in the first approach. After that, a correlation among residuals and the Breusch–Pagan test of independence are calculated. The correlation is -0.1537 and the Breusch-Pagan test is not rejected. The acceptance of endogeneity and error correlations between the two

equations support the suitability of this methodology to deal with the hypothesis outlined in this paper. The econometric method able to estimate this kind of model is 3SLS (Zellner and Theil, 1962). 3SLS gathers up 2SLS (endogeneity) and SUR (contemporary correlations among equations). Nonetheless, there is another issue to deal with, i.e. heteroskedasticity. Such issue generally affects the efficiency of the estimator and thus the individual significance of the estimates. Firstly, both equations are estimated separately by OLS. Secondly, the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity is applied on the residuals of both equations. The null hypothesis (homoskedasticity) is rejected.
Endogeneity, contemporary correlation and heteroskedasticity can be treated by the generalized method of moments (GMM). Such estimation (robust 3SLS) is carried out but it did not achieve a solution due to the non-positive semidefinite residual covariance matrix. Thus, 3SLS is carried out. The non-resolved question of heteroskedasticity produces an efficiency loss in the 3SLS estimation but it addresses endogeneity and contemporary correlation.

3.2.2 The reduced form

This form expresses the endogenous variables as a function of exogenous explanatory variables. This form has three important implications in a simultaneous equations model: it allows for the identification of the models (alternatively to the condition: $K - k >= m - 1$, *already explained*), estimators such as 3SLS or IOLS, among others, use the reduced form to figure out the system and, it permits evaluating the direct impact of any exogenous explanatory variable in any endogenous variable. The equations model in reduced form are the following ones:

$$exporigin_i = [(\beta_1\gamma_2 + \beta_2)/(1-\beta_1\gamma_1)]income_i + \sum_{t=1}^{4}[(\beta_1\gamma_{3t} + \beta_{3t})/(1-\beta_1\gamma_1)]term_{it}$$
$$+ \sum_{y=2009}^{2011}[(\beta_1 + \beta_{4y})/(1-\beta_1\gamma_1)]year_{iy} + \sum_{h=1}^{31}[(\beta_1\gamma_{5h} + \beta_{5h})/(1-\beta_1\gamma_1)]pa_{ih}$$
$$+ \sum_{h=1}^{31}[(\beta_1\gamma_{6h} + \beta_{6h})/(1-\beta_1\gamma_1)]pal_{ih} + \sum_{d=1}^{7}[(\beta_1\gamma_{7d} + \beta_{7d})/(1-\beta_1\gamma_1)]destination_{id} +$$
$$\sum_{d=1}^{19}[(\beta_1\gamma_{8c} + \beta_{8c})/(1-\beta_1\gamma_1)]country_{ic} ++ \sum_{r=1}^{4}[(\beta_1\gamma_{9r} + \beta_{9r})/(1-\beta_1\gamma_1)]party_{ir}$$
$$+ \sum_{o=1}^{5}[(\beta_1\gamma_{10r} + \beta_{10r})/(1-\beta_1\gamma_1)]people_{io} + \sum_{m=1}^{16}[\beta_1\gamma_{11m}/(1-\beta_1\gamma_1)]motivation_{im}$$
$$+[(\beta_1\gamma_{12} + \beta_{11})/(1-\beta_1\gamma_1)]previous_i + [\beta_1/(1-\beta_1\gamma_1)]e_i + [1/(1-\beta_1\gamma_1)]u_i \quad (5)$$

$$expdestination_i = [(\gamma_1\beta_2 + \gamma_2)/(1-\beta_1\gamma_1)]income_i + \sum_{t=1}^{4}[(\gamma_1\beta_{3t} + \gamma_{3t})/(1-\beta_1\gamma_1)]term_{it}$$
$$+ \sum_{y=2009}^{2011}[(\gamma_1\beta_{4y})/(1-\beta_1\gamma_1)]year_{iy} + \sum_{h=1}^{31}[(\gamma_1\beta_{5h} + \gamma_{5h})/(1-\beta_1\gamma_1)]pa_{ih}$$
$$+ \sum_{h=1}^{31}[(\gamma_1\beta_{6h} + \gamma_{6h})/(1-\beta_1\gamma_1)]pal_{ih} + \sum_{d=1}^{7}[(\gamma_1\beta_{7d} + \gamma_{7d})/(1-\beta_1\gamma_1)]destination_{id} +$$
$$\sum_{d=1}^{19}[(\gamma_1\beta_{8d} + \gamma_{8d})/(1-\beta_1\gamma_1)]country_{ic} + \sum_{r=1}^{4}[(\gamma_1\beta_{9r} + \gamma_{9r})/(1-\beta_1\gamma_1)]party_{ir}$$
$$+ \sum_{o=1}^{5}[(\gamma_1\beta_{10r} + \gamma_{10r})/(1-\beta_1\gamma_1)]people_{io} + \sum_{m=1}^{16}[\gamma_{11m}/(1-\beta_1\gamma_1)]motivation_{im} +$$
$$[(\gamma_1\beta_{11} + \gamma_{12})/(1-\beta_1\gamma_1)]previous_i + [\gamma_1/(1-\beta_1\gamma_1)]u_i + [1/(1-\beta_1\gamma_1)]e_i \quad (6)$$

Equations (5) and (6) are the origin and destination equations in reduced form, respectively.

4. RESULTS

4.1 *Results from the structural form*

The results of the 3SLS estimation are shown in Table 1 and 2. These results correspond to the structural form of the model. Hence, only signs and significance of the parameters can be analyzed. The interpretation requires the employment of the reduced form, as shown in equations (5) and (6).

Most of the parameters estimated are highly significant. Both expenditure at origin and expenditure at destination are positive and below 1, as expected. It shows the interrelationship between both variables. Income is positive as suggested by the economic theory and the number of previous visits has a different impact for each kind of expenditure. More experienced tourists decrease their expenditure at origin but increase it at destination. It could be related to the level of knowledge of the destination, since tourists are more familiar with the destination and they feel more confident about finding the services and products that suit their needs at an acceptable price. Discarding all other variables, the country of origin makes a difference and it is necessary to control such differences. It is also relevant to distinguish the island of destination, because they are not homogeneous neither in terms of the variety of supply nor the level of competition in these markets. The party composition clearly affects expenditure. Although the analysis considers expenditure in per capita terms, the number of people who accompany the tourists will affect total expenditure. For instance, concerning accommodation expenditure, a single traveller is expected to spend more in per capita terms than a couple because sharing accommodation is usually cheaper. Each tourist behaves differently at the destination depending on their preferences and motivations for travelling. Consequently, the model takes into account the main motivations. The most significant ones are shown in Table 1.

Table 1. Structural form results of 3SLS estimation (part I)

	Origin equation		Destination equation	
	Parameter	Std. desv	Parameter	Std. desv
Expenditure in origin	-	-	0.182***	(0.068)
Expenditure in destination	0.585***	(0.050)	-	-
Income	0.002***	(0.000)	0.001***	(0.000)
Previous visits	-0.044***	(0.006)	0.021***	(0.005)
Time				
Term 2	-3.379***	(0.434)	1.421***	(0.364)
Term 3	-3.807***	(0.498)	1.122***	(0.418)
Term 4	-2.830***	(0.476)	1.078***	(0.375)
Year 2010	3.322***	(0.360)	-	-
Year 2011	3.015***	(0.442)	-	-
Destination				
Lanzarote	0.337***	(0.095)	-0.315***	(0.070)
Fuerteventura	-0.014	(0.102)	0.210***	(0.075)
Gran Canaria	-0.505***	(0.101)	-0.489***	(0.090)
Tenerife	0.318***	(0.102)	-0.762***	(0.066)
La Gomera	-0.146	(0.183)	-0.196	(0.133)
La Palma	-0.900***	(0.152)	0.769***	(0.112)
El Hierro	0.187	(0.589)	0.368	(0.426)

*** p<0.01, **p<0.05, *p<0.10

Table 1 (continues). Structural form results of 3SLS estimation (part I)

	Origin equation		Destination equation	
	Parameter	Std. desv	Parameter	Std. desv
Origin				
Germany	-5.854***	(1.655)	-11.063***	(1.453)
Austria	8.264***	(2.141)	-9.813***	(1.507)
Belgium	2.926	(1.825)	-6.408***	(1.295)
Denmark	3.651**	(1.847)	-9.607***	(1.287)
Spain	-12.961***	(1.485)	2.920**	(1.398)
Finland	2.921	(1.864)	-10.471***	(1.299)
France	0.611	(1.870)	-6.430***	(1.330)
The Netherlands	-6.554***	(1.735)	-9.525***	(1.496)
Ireland	-21.804***	(1.670)	7.710***	(1.732)
Italy	-2.706	(1.954)	-1.754	(1.430)
Norway	-5.809***	(1.733)	-1.842	(1.361)
Poland	-12.047***	(2.241)	-0.266	(1.855)
Portugal	-12.064***	(2.569)	-2.097	(2.075)
United Kingdom	-14.945***	(1.581)	-6.932***	(1.772)
Czech Republic	-1.369	(2.952)	-11.989***	(2.189)
Russia	-9.452***	(2.836)	19.822***	(1.917)
Sweden	2.931	(1.802)	-12.080***	(1.247)
Switzerland	9.407***	(1.958)	-8.523***	(1.420)
Luxembourg	16.346***	(3.792)	-8.791***	(2.851)

*** p<0.01, **p<0.05, *p<0.10

Table 1 (continues). Structural form results of 3SLS estimation (part I)

	Origin equation		Destination equation	
	Parameter	Std. desv	Parameter	Std. desv
Main motivation				
Theme park	-	-	1.643**	(0.765)
Golf	-	-	9.846***	(1.014)
Other sports	-	-	-1.840*	(1.023)
Nightlife	-	-	4.274***	(0.633)
Shopping	-	-	5.169***	(0.628)
New place	-	-	-1.311***	(0.454)
Ease of traveling	-	-	-2.916***	(0.409)
Price			-4.663***	(0.888)
For kids			-1.893***	(0.529)
Observations	53,608		53.608	
R^2	0.842		0.718	
Chi^2	2.89e+05		1.37e+05	

*** p<0.01, **p<0.05, *p<0.10

Table 2 shows the estimates of the dummy variables that are used to identify each tourist profiles. These results belong to the same estimation as in Table 1, but they are shown in a separate table for the ease of presentation. As shown in Figure 1, it is important to distinguish between Non-LCC and LCC estimates. The first ones correspond to a shift from the benchmark and 60 out of 62 estimates are significant, which prove the relevance of such distinction. However, LCC dummies are an additional shift from non-LCC shift. Their significance is critical, because it tests if LCC travellers spend differently than Non-LCC travellers, and hence they test the hypothesis enquired in this paper. The table shows that 35 out of 62 estimates are significant, which means that LCC travellers for these combinations of accommodation and food regime are different from Non-LCC travellers. Nevertheless, the results from the structural form cannot be used to measure the direct impact of each dummy, but rather to test the direction of the impact and it significance. In order to measure the impact, it is necessary to obtain these results by the reduced form as shown in Table 3.

Table 2. Structural form results of 3SLS estimation (Part II)

Non-LCC	Origin equation		Destination equation	
	Parameter	Std. desv	Parameter	Std. desv
Flight only				
5 stars hotel	-7.606	(8.862)	130.161***	(6.950)
4 stars hotel	14.800**	(6.825)	90.253***	(6.651)
3,2 or 1 stars hotel	17.171***	(6.458)	73.906***	(6.276)
Apartment	16.103***	(5.680)	65.531***	(5.709)
Friends and family	25.071***	(4.992)	44.614***	(5.398)
Other	27.826***	(5.406)	49.915***	(5.872)
Flight and Accommodation				
5 stars hotel	102.242***	(7.306)	72.965***	(12.194)
4 stars hotel	75.679***	(5.402)	47.179***	(9.028)
3,2 or 1 stars hotel	56.268***	(5.353)	49.695***	(7.786)
Apartment	53.837***	(5.216)	48.885***	(7.576)
Other	51.411***	(5.431)	46.114***	(7.297)
Flight, accommodation and breakfast				
5 stars hotel	114.416***	(6.140)	57.306***	(12.255)
4 stars hotel	89.794***	(5.544)	49.033***	(10.086)
3,2 or 1 stars hotel	70.638***	(5.504)	47.437***	(8.704)
Apartment	66.021***	(5.388)	46.611***	(8.391)
Other	83.573***	(13.895)	30.455**	(12.910)

*** p<0.01, **p<0.05, *p<0.10

Table 2 (continues). Structural form results of 3SLS estimation (Part II)

Non-LCC	Origin equation		Destination equation	
	Parameter	Std. desv.	Parameter	Std. desv.
Flight, accommodation and half board				
5 stars hotel	127.901***	(5.373)	35.821***	(12.315)
4 stars hotel	90.219***	(5.014)	35.368***	(9.572)
3,2 or 1 stars hotel	71.111***	(5.075)	38.490***	(8.404)
Apartment	72.649***	(5.097)	37.799***	(8.478)
Other	77.778***	(9.290)	38.801***	(10.334)
Flight, accommodation and full board				
5 stars hotel	129.789***	(5.914)	29.751**	(12.363)
4 stars hotel	92.318***	(5.056)	31.847***	(9.567)
3.2 or 1 stars hotel	80.284***	(5.354)	33.219***	(8.897)
Apartment	71.242***	(5.676)	34.092***	(8.427)
Other	129.932***	(5.687)	22.668*	(12.160)
Flight, accommodation and all inclusive				
5 stars hotel	125.542***	(5.194)	21.548*	(11.597)
4 stars hotel	99.646***	(4.724)	22.534**	(9.727)
3.2 or 1 stars hotel	89.705***	(4.792)	25.560***	9.171)
Apartment	82.958***	(4.923)	29.942***	(8.891)
Other	136.551***	(5.551)	14.949	(12.291)

*** p<0.01, **p<0.05, *p<0.10

Table 2 (continues). Structural form results of 3SLS estimation (Part II)

LCC	Origin equation		Destination equation	
	Parameter	Std. desv	Parameter	Std. desv
Flight only				
5 stars hotel	1.156	(5.086)	-11.154***	(3.652)
4 stars hotel	-1.386	(3.192)	-12.686***	(2.316)
3.2 or 1 stars hotel	3.858	(3.731)	-8.354***	(2.664)
Apartment	-2.086	(1.908)	-1.446	(1.379)
Friends and family	-4.040***	(1.239)	2.127**	(0.907)
Other	-4.443*	(2.559)	1.667	(1.850)
Flight and Accommodation				
5 stars hotel	-0.897	(5.161)	-16.616***	(3.726)
4 stars hotel	-8.813***	(2.112)	0.878	(1.623)
3,2 or 1 stars hotel	-9.360***	(1.782)	2.416*	(1.380)
Apartment	-7.815***	(0.721)	1.704**	(0.690)
Other	-3.971	(2.607)	1.119	(1.888)
Flight, accommodation and breakfast				
5 stars hotel	-10.057***	(2.732)	2.299	(2.054)
4 stars hotel	-10.735***	(2.151)	1.717	(1.701)
3.2 or 1 stars hotel	-6.020*	(3.226)	5.539**	(2.318)
Apartment	-10.409***	(2.749)	-0.433	(2.117)
Other	-24.301	(16.176)	24.828**	(11.634)

*** p<0.01, **p<0.05, *p<0.10

Table 2 (continues). Structural form results of 3SLS estimation (Part II)

LCC	Origin equation		Destination equation	
	Parameter	Std. desv	Parameter	Std. desv
Flight, accommodation and half board				
5 stars hotel	-9.156***	(2.639)	1.914	(1.981)
4 stars hotel	-8.990***	(1.085)	3.986***	(0.909)
3,2 or 1 stars hotel	-2.623	(2.001)	0.427	(1.444)
Apartment	-9.585***	(2.265)	5.225***	(1.681)
Other	-3.286	(11.397)	-8.374	(8.212)
Flight, accommodation and full board				
5 stars hotel	-14.699**	(7.224)	10.954**	(5.222)
4 stars hotel	-3.556	(2.693)	-0.034	(1.953)
3,2 or 1 stars hotel	-2.614	(4.199)	-0.471	(3.028)
Apartment	-4.008	(4.300)	7.506**	(3.083)
Other	-8.843	(7.152)	5.843	(5.171)
Flight, accommodation and all inclusive				
5 stars hotel	-10.666***	(3.727)	0.679	(2.770)
4 stars hotel	-8.748***	(1.036)	3.123***	(0.873)
3,2 or 1 stars hotel	-13.828***	(1.557)	4.150***	(1.370)
Apartment	-14.490***	(1.773)	5.059***	(1.491)
Other	-20.593***	(5.716)	7.985*	(4.276)

*** p<0.01, **p<0.05, *p<0.10

4.2 Results from the reduced form

Reduced form results are a convenient transformation from the structural form results that deal with the system iterations in order to reveal the “true” direct impact of each exogenous variable. Such transformation is applied to key dummies presented in Table 1 and shown in Table 2. Income elasticities can be obtained from the reduced form. In particular, income elasticity with respect to expenditure at origin is 1.74, whereas at destination such elasticity is 1.98.

Table 3. Reduced form results: The impact of LCC with respect to non-LCC by mean nights and mean party size (euros)

	Origin-Destination	5*	4*	3,2,1*	Apartment	Friends or relatives	Other
Only flight (F)	O	-92.36	-187.05	-16.46	-84.81	**-70.97***	-99.72*
	D	-188.27*	-274.78*	-52.78	-52.78	**35.38***	24.74
(F) + Accommodation (A)	O	-196.67	-167.03*	-173.60*	**-179.97***		-106.30
	D	-310.80*	-14.54	15.64*	**7.52***		12.76
(F+A) + Breakfast	O	-145.82*	-159.24*	-40.22*	-208.11*		-195.27
	D	7.91	-3.81	64.31*	-45.35		407.73*
(F+A)+Half Board	O	-169.31*	**-136.13***	-47.31	-146.99*		-168.91
	D	5.30	**48.11***	-0.99	78.45*		-185.13
(F+A)+Full Board	O	-138.67*	-66.16	-54.47	9.38		-112.71
	D	138.56*	-12.58	-17.83	165.83*		88.01
(F+A)+ All-inclusive	O	202.91*	**-152.33***	-248.29*	-285.26*		-362.25*
	D	-24.86	**33.78***	35.68*	60.04*		96.59*

* Means that the original dummy variable from Table 4 is significant
Bold font means top four most relevant tourist profiles

Table 3 shows how much more or less each LCC profile is spending at origin and destination. This result is weighted by mean nights and mean party size in order to obtain a figure closer to the one faced by each tourist. For the four most relevant profiles the results are similar. All of them save money at origin with respect to Non-LCC tourists. In particular, saving figures vary between 70.97 euros and 179.97 euros per mean party size and nights. The key enquiry of this paper is to test if such savings are transferred into higher expenditure at the destination. It proves that for the most popular profiles LCC tourists spend more money than Non-LCC tourists. This higher expenditure varies between 7.52 euros and 48.11 euros per mean party size and nights. This figure proves the hypothesis that LCC tourists' savings at origin are transferred, at least partially, as higher expenditure at the destination.

4.3 Savings transfer ratios

It is interesting to calculate the percentage of savings at the origin that is transferred as additional expenditure at the destination. Out of the four most relevant profiles, the one of tourists who book only the flight and stay in friends or relatives accommodation transfer 49.8%, which represents the highest transfer value. On the contrary, tourists who book flight and apartment with self-catering transfer only 4.1% of their savings. Tourists who stay in a four* hotel with half board transfer 35.3%, whereas those who stay in a four* hotel with all-inclusive transfer 22.1%. Thus, it is clear that despite the fact that hypothesis is true, there is net savings, so that not all the savings are transferred as additional expenditure at the destination.

5. CONCLUSIONS

The Canary Islands, as many other tourism destinations around the world, have faced a relevant market structure change. Tourists are travelling more often with LCC airlines and it has an impact on the destination. On the one hand, LCC tourists' perception of saving money with cheaper air fares may encourage them to spend more money at the destination. On the other hand, LCC airlines may increase air traffic towards a particular destination. This paper tests if the former hypothesis is true. For that purpose, a system of equations of expenditure at origin and expenditure at the destination is considered. Within all econometric methods that may estimate such system, the 3SLS model is chosen because it is able to deal with endogeneity and contemporary error correlation appropriately.

Another issue concerning the destination is related to a redistribution of the relevance of each tourist profile due to the presence of LCCs. LCC travellers may be willing to stay at different kinds of accommodation or to enjoy simple meal packages with respect to traditional Non-LCC travellers. Hence, it may imply a redistributing effect of tourist profiles within a destination. In the Canary Islands, the tourist profiles that experience significant growth are "Only flight + Staying with friends or relatives", "Flight + Staying in apartment with Self-catering", whereas the tourist profiles that reduce their presence are "Flight + Staying in 4* hotel with Half-board" and "Flight + Staying in 4* hotel with All-inclusive". It is also relevant to note that the average length of stay is also different between LCC tourists and Non-LCC tourists. For instance, in the case of "Only flight + Staying with friends or relatives", LCC tourists stay, on average, 2 days less than Non-LCC tourists. However, for the rest of relevant tourist profiles, LCC tourists stay, on average, 1 day less than Non-LCC tourists. Finally, it should be noted that the mean party size hardly varies between LCC and Non-LCC tourists.

Identifying the role of LCC with an econometric model is not straightforward. It is necessary to compare *vis-a-vis* the expenditure of LCC tourists to Non-LCC tourists. For that purpose, the set of tourist products (i.e. package and accommodation) needs to be exactly the same, except for one factor which is the air company chosen (i.e. if the tourist travels by LCC or not). It makes sense for large samples. The way to distinguish between tourist products and the kind of air company chosen is employing dummy variables. The significance of the dummy variables is necessary to test the significance of the model specification. Provided that the dummy variables are significant, the focus is the value of the difference between dummies associated with LCC tourists and Non-LCC tourists. Such differences will determine, ceteris paribus, how much more or less every kind of tourist is spending at the destination.

The results of the econometric model are appropriate because they are significant and they show the expected signs and values. More precisely, the results show that, on average, the hypothesis is true. It means that, ceteris paribus, tourists who travel with LCCs are spending more money at the destination per night and party size than those tourists who do not travel with LCCs. Even though, such transfer ratios are usually lower than fifty per cent, these can differ by tourist profiles. Amongst the most popular tourist profiles, the highest savings transfer rate belongs to "flight + stay with friends or relatives" tourist profile, which reaches 49.8%. For the rest of the relevant tourist profiles the percentages are lower. For instance, the case of "flight + apartment with self-catering" has got a transfer rate of 4.1%, that of "flight + 4* hotel with half-board" has got a savings transfer rate of 35.3% and finally, "flight + 4* with All-inclusive" has got a savings transfer rate of 22.1%. It proves that savings transfer is heterogeneous by tourist profiles and that not all the savings are finally transferred, but some are net

savings for the tourist. It should be taken into account that, despite the existence of such LCC savings transfers, LCC tourists also stay less nights at the destination. Thus, this is an interesting issue to explore due to its consequences in terms of total expenditure and economic growth of the destinations.

It should be noted that the same methodology can be applied to test the hypothesis to any origin airport, destination airport or route. The model can also focus on specific airlines, if required. However, it only takes into account a part of the story because the flow of tourists is not measured. Hence, this analysis requires the complementary study of forecasting LCC and Non-LCC tourist arrivals. Both studies together provide light on final added value and therefore on GDP growth and employment. Such results are relevant to assess the entrance of LCCs at the destination. Future research may also focus on related issues, such as the role of expenditure at origin and how it is converted into added value at the destination. Moreover, it would be interesting to explore the nationality issue of the LCCs and how this affects the control on frequency and air fares, which might be a sensitive issue for a destination.

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