Research note

Analysing passenger behaviour towards the catering industry: Implications for airport management

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ABSTRACT

This research note seeks to provide the most detailed analysis yet of passenger behaviour towards the airport catering industry. With the broadest sample to date among similar studies, namely 37,000 passengers surveyed at 8 different airports with 38 explanatory variables, a large number of conclusions have been drawn. The most important of these is that the factors that most influence a passenger's using a catering establishment during his/her stay at an airport are his/her physiological needs and social reasons. However, contrary to what was anticipated a priori, socioeconomic status only has a moderate influence, while having a wide range and variety of foodstuffs on offer does not result in passengers consuming more. It is also observed that low-cost airline passengers consume less than those of traditional airlines, probably due to the stress related to boarding with these types of airlines.

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1. Introduction

The growth in air traffic today and the need for airports to optimise their nonaeronautical revenue to compensate for the loss in aeronautical revenue from airport taxes due to the low-cost phenomenon, has turned airports into sophisticated shopping arcades (Mocica-Brilha, 2008) that can even act as a lure in their marketing campaigns (Graham, 2008). A fundamental part of this commercial role is the food and drink services provided at airports, which range from traditional fast-food chains to restaurants headed by Michelin star chefs.

In this context, both airport managers and operators of catering establishments at airports increasingly find a need for rigorous studies analysing the factors that influence the likelihood that a passenger will consume food or drink at a catering establishment during the time he/she spends at an airport.

Despite this need, this is clearly an under-researched field, especially from the angle of hospitality research. To fill this gap this paper provides the fullest passenger–consumer profile to date, which includes 38 explanatory variables. Specifically, both socio-demographic and purchasing power factors are analysed, as are trip attributes. We also take into consideration the influence of social customs and habits when travelling and variables that seek to measure the range of catering establishments on offer at airports.

2. Data, methodology and results

Our research uses what is possibly the largest and most varied database (see characteristics in Table 1) that has ever been used to analyse passenger behaviour vis-à-vis the catering industry at airports (see Castillo-Manzano and López-Valpuesta, 2013 for another application for this database). Apart from the large number of passengers surveyed, 37,226, it should also be noted that 8 airports have been considered, including Spain's 2 international hubs (Madrid-Barajas and Barcelona-El Prat), which are among the 10 largest airports in Europe, 2 regional hubs (Alicante and Tenerife Sur) and 4 regional airports (Almeria, Santiago, Seville and Valencia).

A dichotomous-choice response question is examined, so we have a variable binary dependent variable with a value of 1 if the passenger consumes food or drink at the airport before boarding and 0 otherwise. We decided on a Probit specification, since it maximises the log pseudo likelihood (-29174171) when compared to a Logit (-29175014). Table 2 gives the dependent variables used in the model and the estimation of the marginal effects at the mean.

As Table 2 shows, there are a large number of significant results, 22 to be precise. The vast majority of these, 17, are at 1%, the maximum significance level. One important finding is that consuming food and drink and making a purchase are 2 activities that are closely linked, as can be seen by the fact that making a purchase increases the likelihood of consuming food or drink by over 11% (see results for Purchase variable).

Secondly, it is clear that waiting time is the principal reason for the consumption of food and drink, with passengers waiting in excess of 3 h being 33% (value of variable m.,Waiting_Time,

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Table 1
Survey of technical data.

Airport		Almeria	Alicante	Barcelona-El Prat	Madrid-Barajas	Santiago	Seville	Tenerife Sur	Valencia
Airport traffic in 2010		786,877	9,382,931	29,209,536	49,866,113	2,172,869	4,224,718	7,358,986	4,934,268
Sampling	General				Departing passengers > 15 years of age				
	Sample size (before weighting)	1808	3202	6931	9096	3530	6027	3092	3540
	Sampling method	The sample was distributed by terminal, by route within each terminal, and proportionately to the traffic. Personal interviews were computer-aided. A supervisor made sure that each team of interviewers selected the passengers that were interviewed randomly							
	Sampling error	±2.1%	±1.7%	±1.2%	±1.0%	±1.6%	±1.2%	±1.8%	±1.7%
Field work	Location				Departure lounges				
	Time period (month/year)	5/2010	7/2010	6/2010	6/2010	7/2010	7/2010	7/2010	7/2010
	Timetable	Monday–Sunday. Shifts were conducted from 6 am to 10 pm, with times extended during periods of high traffic							

Table 2
Marginal effects at the mean (%).

Variable	Explanation	Likelihood of consuming food or drink
(a) Purchase	1 If the passenger makes a purchase, 0, otherwise.	△ 11.39% (1.26)[***]
(b) Sex	1 If male, 0 if female.	∇ 0.29% (0.55)
(c) Age	1 < 30; 2 = 31–49; 3 = 50–64; 4 > 65.	∇ 0.07% (0.23)
(d) Spanish	1 If passenger is Spanish, 0 if passenger is foreign.	△ 1.21% (0.76)
(e) Education	1 = no formal or only primary education; 2 = completed secondary education; and 3 = holds university degree.	△ 1.19% (0.29)[***]
(f) Reason for travel. Base category: holiday passenger		
(f.1) Business	1 If trip is for business reasons, 0, otherwise.	∇ 1.20% (1.37)
(f.2) VFR (visiting friends and relatives)	1 If trip is for VFR, 0, otherwise.	∇ 4.33% (1.50)[***]
(g) Employment status. Base category: employee		
(g.1) Housewife	1 If passenger is a housewife, 0, otherwise.	△ 3.19% (1.81)[*]
(g.2) Student	1 If passenger is a student, 0, otherwise.	∇ 4.61% (1.29)[***]
(g.3) Retired	1 If passenger is retired, 0, otherwise.	∇ 3.48% (1.03)[***]
(g.4) Freelance or self-employed	1 If passenger is freelance or self-employed, 0, otherwise.	△ 2.89% (1.47)[**]
(g.5) Unemployed	1 If passenger is unemployed, 0, otherwise.	∇ 4.23% (3.06)
(h) Airline. Base category: traditional airline		
(h.1) National low-cost carrier. (LCC)	1 If passenger is flying by a national LCC; 0, otherwise.	△ 1.15% (0.88)
(h.2) International low-cost carrier	1 If passenger is flying by an international LCC; 0, otherwise.	∇ 6.35% (2.44)[***]
(h.3) Charter	1 If passenger is flying on a charter airline, 0, otherwise.	∇ 3.15% (2.29)
(i) Connecting flight	1 If passenger is connecting to another flight at the airport, 0, if travelling no further.	∇ 0.23% (0.72)
(j) Destination. Base category: domestic flight		
(j.1) Eurozone international destination	1 If passenger is taking an international flight with a final destination in a Eurozone country, 0, otherwise.	∇ 0.81% (0.29)[***]
(j.2) Non-Eurozone international destination.	1 If passenger is taking an international flight with a final destination outside the Eurozone, 0, otherwise.	△ 3.68% (1.53)[**]
(k) Internet	1 If passenger has purchased his ticket over the Internet, 0, otherwise.	△ 0.23% (0.36)
(l) Duration of the trip	1 = 0–1 days; 2 = 2–7 days; 3 = 8–14; 4 = 15–30; 5 > 30 days.	∇ 1.38% (0.26)[***]
(m) Waiting time prior to boarding	1 < 1 h; 2 = 1–2 h; 3 = 2–3 h; 4 > 3 h.	△ 11.12% (0.09)[***]
(n) Weekend	1 If the survey was taken on a Saturday or Sunday, 0, otherwise.	∇ 0.09% (2.44)
(o) Accessibility. Base category: private vehicle		
(o.1) Taxi	1 If passenger has travelled to the airport by taxi, 0, otherwise.	∇ 4.00% (2.01)[**]
(o.2) Courtesy bus	1 If passenger has travelled to the airport by courtesy bus, 0, otherwise.	∇ 11.82% (3.05)[***]
(o.3) Rent-a-car	1 If passenger has travelled to the airport by rental car, 0, otherwise.	△ 1.95% (3.54)
(o.4) Public transport	1 If passenger has gone to the airport by public transport, 0, otherwise.	∇ 2.1% (0.31)[***]
(p) Group size	1 = travelling alone; 2 = 2 people; 3 = 3 or more people.	△ 4.03% (0.60)[***]
(q) Children	1 If passenger is flying with children, 0, otherwise.	∇ 4.50% (1.33)[***]
(r) Accompaniment		
(r.1) Work	1 If passenger is travelling with work colleagues, 0, otherwise.	∇ 5.13% (0.71)[***]
(r.2) Friends	1 If passenger is travelling with friends, 0, otherwise	△ 0.40% (3.22)
(r.3) Family	1 If passenger is travelling with family, 0, otherwise.	△ 3.96% (1.99)[**]
(s) Farewell	1 If someone goes to see off the passenger at the airport, 0, otherwise.	△ 2.02% (0.50)[***]
(t) Availability	From less to greater availability: 1 = hotels and similar; 2 = home of relatives or friends; 3 = passenger's first or second home.	∇ 1.68% (0.37)[***]
(u) Autonomous community	1 If passenger's place of residence is in the autonomous community where the airport is located, 0, otherwise	∇ 4.26% (1.09)[***]
(v) Airport traffic	Thousands of passengers per week at each airport at the time that the surveys were taken.	∇ 0.01% (0.01)
(w) Number of catering establishments	Coefficient of number of catering establishments per every 1000 passengers.	∇ 48.26% (45.33)
(x) Floor space occupied by catering establishments (m^2)	Coefficient of square metres of Floor space occupied by catering establishments per every 1000 passengers.	△ 0.02% (0.10)
(y) McDonald's	1 If the airport has a McDonald's outlet, 0, otherwise.	△ 0.92% (3.44)

Note: Standard errors robust to heteroscedasticity and clustered by airport of origin.

[*] Coefficient significance at the 10% level.

[**] Coefficient significance at the 5% level.

[***] Coefficient significance at the 1% level.

multiplied by 3) more likely to consume something than those whose waiting time is less than 1 h. Waiting times at airports have increased due to the ever more stringent security checks that require passengers to arrive at the airport in advance. This has led to increased passenger expenditure at airport outlets (Echevarne, 2008). Passengers travelling on long intercontinental journeys are also more likely to consume food or drink (almost 4%, i.e., the result for variable *j*.2). Others who consume more are passengers who have found it more difficult to satisfy their needs before arriving at the airport (Availability and Autonomous Community variables) because they are far from home.

For De Castro and De Castro (1989) social factors are a major influence on people's eating behaviour. We arrived at this same conclusion in the airport environment. A passenger travelling with 2 or more family members is 12% (sum of the results for variables *r*.3 and *p* with the latter multiplied by 2) more likely to consume food or drink and if someone comes to see a passenger off the likelihood increases by 2% (Farewell variable). This behaviour is not restricted to the consumer at the airport as, generally speaking, people in a group tend to consume more (De Castro and De Castro, 1989). However, this pattern is broken if the group includes children. Travelling with children reduces the likelihood of eating in a catering establishment at the airport (see Children variable), as other studies have also shown to be the case outside the airport environment (Ham et al., 2004).

Some variables that measure socioeconomic status directly, such as Employment Status and Education, or indirectly, such as travelling to the airport by Taxi, are also significant. This is consistent with other studies on eating behaviour in general terms (see Ham et al., 2004). However, despite the fact that these variables are statistically significant, it is important to highlight the low absolute value of the marginal effects.

A new conclusion compared to earlier studies is the low-cost passenger's behaviour regarding eating and drinking at the airport. For Echevarne (2008), airport catering has benefited from the arrival of low-cost airlines as the majority of these charge for food and drink on board, which should benefit their consumption before boarding. However, our empirical evidence (see the significance of the *h*.2 variable) shows that, passengers travelling on non-Spanish low-cost carriers (principally Ryanair and Easyjet) consume less. We believe that this finding is linked to the behaviour of these companies towards their passengers, and that the conclusion cannot therefore be drawn that low-cost passengers are 'lower quality' and as such consume less food and drink. Also, we have corrected for a large number of socioeconomic variables on the one hand and, on the other, the National Low-cost carrier variable is not significant. This last variable basically includes the carrier Vueling, whose treatment of its passengers is not as aggressive as the treatment afforded by Ryanair and Easyjet.

But, from the point-of-view of hospitality management, the most surprising conclusion is that for such a broad sample and a population of 37,226 passengers, the range of catering establishments available at the airport does not seem to have any influence on consumption. In other words, neither the number or the variety of restaurants (measured by the Floor space and Number of Catering Establishments variables) seem to be of importance; not even the presence of a McDonald's, the world leader in fast food (present at 2 of the 8 airports studied) and whose business model seems well-suited to passengers from a variety of different places who want fast, homogeneous and clean service (Park, 2004). Airport traffic volume does not have any influence, either, although it might be supposed a priori that greater numbers of passengers at an airport and in its catering establishments might act an enticement for other passengers (see Tse et al., 2002).

3. Conclusions

Consuming food or drink in an airport catering establishment is the most frequent nonaeronautical activity that passengers do at an airport. According to the broad sample analysed, this was done by 17,608 passengers, i.e., by 47.26% of the passengers, compared to only 26.65% who made a purchase. However, our findings show that consuming food and drink and making a purchase are 2 activities that are closely linked. The findings also show that physiological needs and social reasons are for the most part what determine that a passenger uses a catering establishment. With respect to the former, the findings have positively highlighted passengers who are going to take a long-haul flight, who have found it more difficult to satisfy their physiological needs before arriving at the airport and, especially, the time that they have to wait at the airport. Social factors include travelling in a group, especially with family members, or people coming to see them off.

Another range of factors that act as proxies of the passenger's socioeconomic status are also significant, though to a much lesser extent.

In other respects, passengers of strict low-cost model airlines are less likely to consume any food or drink. This could be put down to the greater stress that these passengers are subjected to; apart from the normal stress that every passenger is under, for fear of missing the flight and that associated with check in and security checks (Graham, 2008), passengers of these airlines are confronted with the fact that generally they cannot reserve their seats and that there is a strict weight limit imposed on hand luggage, which is stringently checked before boarding. This means that these passengers are quicker to go to the areas around the boarding desks and forego any possible purchases. The trade-off is that they could be prime candidates for consuming food or drink at small outlets in the area of the boarding gates. There might even be a niche in the market for food vendors peddling their fare up and down the queues as they do at sporting events.

Finally, there is no empirical evidence at all that the range and type of establishments on offer have any significant influence on passenger behaviour regarding the consumption of food and drink.

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References

Castillo-Manzano, J.I., López-Valpuesta, L., 2013. Check-in services and passenger behaviour: self service technologies in airport systems. Computers in Human Behavior 29, 2431–2437.

De Castro, J.M., De Castro, E.S., 1989. Spontaneous meal patterns of humans: influence of the presence of other people. The American Journal of Clinical Nutrition 50, 237–247.

Echevarne, R., 2008. The impact of attracting low-cost carriers to airports. In: Graham, A., Papatheodouru, A., Forsyth, A.P. (Eds.), Aviation and Tourism. Ashgate Publishing, Hampshire, pp. 177–191.

Graham, A., 2008. Managing Airports: An International Perspective, 3rd ed. Butterworth Heinemann-Elsevier, Oxford.

Ham, S., Hwang, J.H., Kim, W.G., 2004. Household profiles affecting food-away-from home expenditures: a comparison of Korean and US households. International Journal of Hospitality Management 23, 363–379.

Mocica-Brilha, N., 2008. Airport requirements for leisure travellers. In: Graham, A., Papatheodouru, A., Forsyth, A.P. (Eds.), Aviation and Tourism. Ashgate Publishing, Hampshire, pp. 167–176.

Park, C., 2004. Efficient or enjoyable? Consumer values of eating-out and fast food restaurant consumption in Korea. International Journal of Hospitality Management 23, 87–94.

Tse, A.C.B., Sin, L., Yim, F.H.K., 2002. How a crowded restaurant affects consumers' attribution behavior. International Journal of Hospitality Management 21, 449–454.