When the mall is in the airport: Measuring the effect of the airport mall on passengers' consumer behavior

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ABSTRACT

This paper provides a new approach to evaluating the influence on passenger F&B consumption and expenditure of terminals that approximate to the concept of an airport shopping mall. Using a broad database of 37,226 passengers interviewed at eight different Spanish airports, including two Spanish hub airports, Madrid-Barajas and Barcelona, with a methodology framed within statistical causal inference with Kernel and Radial matching, the results robustly demonstrate that passengers alter their consumption behavior in hub airport malls compared to how they behave at regional airports with a smaller commercial and F&B offer. Specifically, there is an increase of between 3.7 and 4.1% in the likelihood that hub passengers will make a consumption and between 1.2 and 1.3% in the likelihood that they will make a purchase, while mean per-passenger spending increases by 3.53€.

1. Introduction

A great deal of literature currently exists on the growing importance of non-aeronautical revenue in airport management (Del Chiappa et al., 2016; Fasone et al., 2016; Yokomi et al., 2017). A large number of papers address the possible determinants that would explain passengers' consumer behavior at airports. According to these papers, their behavior could be explained using variables that range from waiting time (see the debate surrounding the importance or lack of importance of this variable in Chung et al., 2013); passenger characteristics, from income level (Castillo-Manzano, 2010) to age (Graham, 2008) and gender (Geuens et al., 2004); trip characteristics, including whether the passenger's motive for flying is leisure or business (Lu, 2014) or, for example, whether s/he is flying on a domestic or international flight (Fuerst et al., 2011) or even the type of airline (Gillen and Lall, 2004 or Castillo-Manzano and López-Valpuesta, 2015).

The present paper seeks to complement the prior literature by using a new approach to evaluate whether the fact that the terminal provides a broad and varied commercial and F&B offer has any effect on passengers' spending levels and the likelihood that they will make purchases at airport stores and establishments. The aim is to highlight the role of certain terminals as generators of non-aeronautical revenue and their transformation into *de facto* airport shopping malls (Appold and Kasarda, 2006; Geuens et al., 2004) with a high concentration, high volume and wide range of retail and F&B establishments. Given the

space requirements and high passenger volumes needed to be cost-effective, airport shopping malls are typically located inside the terminal at larger airports and especially at hubs. Hubs are airport network nodes where traffic from several origins can be consolidated and distributed to a diverse range of final destinations (Button, 2002), thus enabling airlines to improve connectivity and increase the number of markets that can be served.

Strategic changes to ensure the viability of many airports (Freathy and O'Connell, 2012) and the success of shopping malls in terminals (Appold and Kasarda, 2006) have led to many airport operators considering enlarging the area devoted to shopping and F&B facilities. We focus on two Spanish airport hubs that have carried out multi-million Euro refurbishment programs, specifically Madrid-Barajas, with approx. €6200 m, and Barcelona, with over €3000 m (see Castillo-Manzano et al., 2015; Castillo-Manzano et al., 2017; Dobruzkes et al., 2017). Barcelona even advertises its new terminal's shopping area with the name of shopping center (http://www.aena.es/es/aeropuerto-barcelona/todas-tiendas.html). These two airports have greatly increased their commercial offer by giving passengers the choice of a vast array of stores carrying the main international brands that are very unlike traditional convenience stores, as well as a large food court with an assortment on offer that ranges from fast food, including McDonalds, Burger King and similar, to thematic restaurants with different degrees of sophistication and price.

Thus, this paper is structured as follows: after this introduction,

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Table 1
Main characteristics of the sample.

Airport		Almería	Alicante	Barcelona-El Prat	Madrid-Barajas	Santiago	Seville	Tenerife Sur	Valencia
Information gathering	Questionnaire	Available in five languages		Available in six languages	Available in five languages	Available in six languages	Available in five languages	Available in five languages	
Commercial offer	Total no. stores (stores in passenger-only areas)	1 (1)	18 (16)	58 (46)	68 (60)	11 (3)	15 (13)	17 (13)	4 (3)
	Total no. restaurants (restaurants in passenger-only areas)	3 (1)	17 (12)	44 (34)	64 (51)	3 (2)	6 (3)	13 (8)	9 (4)
	Total sq.meters, stores (sq. meters airside stores)	305 (305)	2157 (2092)	10941 (9501)	19260 (18234)	723 (159)	1366 (1216)	2832 (2467)	743 (611)
	Total sq.meters, restaurants (sq. meters airside restaurants)	1084 (548)	2362 (1571)	12773 (7178)	20866 (18234)	1305 (335)	7165 (5852)	3863 (1525)	2566 (667)
Sampling	General information	Departing passengers (> 15 years of age) in departure lounges							
	Sample size	1808	3202	6931	9096	3530	6027	3092	3540
	Sampling method	Stratified by traffic segments in which a selection of flights was made for each route, and a group of passengers was selected by means of systematic sampling.							
	Sampling error	± 2,1%	± 1,7%	± 1,2%	± 1,0%	± 1,6%	± 1,2%	± 1,8%	± 1,7%

Section 2 describes the data. Section 3 details the methodology used. Section 4 presents the main empirical outcomes while Section 5 offers conclusions.

2. Data

We use a broad database collected through personal interviews conducted by the Spanish Public-Private (51% vs. 49%) Airport Authority (AENA) during summer 2010. Our research uses a database of 37,226 passengers who were interviewed in departure lounges at eight different Spanish airports (namely Almeria, Alicante, Barcelona, Madrid, Santiago, Seville, Tenerife Sur and Valencia). Table 1 gives the main characteristics of the sample. As can be seen, the greatest care was taken to obtain a broad simple random sample.

Table 1 also shows the great differences that exist between the retail offer at hub and regional airports, with respect to both floor space allocated to commercial areas and number of establishments, both stores and F&B. For example, the number of F&B establishments ranges from 3 at Santiago and Almería airports to 44 at Barcelona and 64 at Madrid-Barajas.

These data make it easy to conclude that what can be found in the case of both Madrid and Barcelona airports is a shopping area that clearly imitates real shopping malls. It should therefore come as no surprise that some new terminology has been used on official maps of Barcelona airport's new terminal; rather than the traditional terminology applied to maps at all other Spanish airports, which only distinguishes between three areas for passengers (Public zone, Passenger-only zone and Boarding area), a fourth has been included to define the area in the terminal where the retail stores are concentrated, called "shopping center".

We focus on 20 different variables that were available in their entirety for 36,271 passengers: one indicator variable, 3 dependents and 16 explanatory variables or covariates that were identified in the academic literature as factors that may be major determinants of airport retail demand.

To be specific, the group of most important variables includes passenger Socio-demographics, with age and gender (Castillo-Manzano, 2010; Chung et al., 2013; Freathy and O'Connell, 2012; Geuens et al., 2004; Lin and Chen, 2013; Lu, 2014) and nationality and place of residence (Freathy and O'Connell, 2012; Geuens et al., 2004; Lin and Chen, 2013) standing out. In this category, income plays a major role in determining passengers' airport shopping intentions (Chung et al., 2013; Lin and Chen, 2013; Lu, 2014). As this is a variable that is not easy to obtain in personal interviews, proxies are usually used, such as education level (education), work status (in work) and means of travel to the airport (taxi), as used in Castillo-Manzano (2010). The passenger's travel behavior or frequency of travel is a factor that should be taken into account (Chung et al., 2013; Freathy and O'Connell, 2012; Geuens et al., 2004; Lin and Chen, 2013; Lu, 2014), and can also be interpreted as an indicator of the passenger's level of income.

Focusing on trip characteristics, other factors that can also affect the passenger's purchase decision and volume of purchases have been highlighted by previous research, including:

a) The reason for traveling, whether leisure, business or VFR (Visiting Friends & Relatives) (Appold and Kasarda, 2006; Chung et al., 2013; Freathy and O'Connell, 2012; Fuerst et al., 2011; Lin and Chen, 2013; Lu, 2014; Torres et al., 2005)

b) In general terms, the duration of the trip, as it is more likely that F&B will be consumed before a long flight (Freathy and O'Connell (2012); Appold and Kasarda (2006) and, in particular, the type of route (Fasone et al., 2016; Fuerst et al., 2011). As very short trips of 0–1 day are clearly correlated with short distances, while connecting passengers at a hub usually fly to more distant destinations, three control variables have been included that help to correct for