



# Exploring the determinants for airport profitability: Traffic characteristics, low-cost carriers, seasonality and cost efficiency



Joost Zuidberg

SEO Amsterdam Economics, 1018 WB Amsterdam, The Netherlands

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## ABSTRACT

Given the growing pressure on aeronautical revenues, the increasing focus on airports' financial performance and the sharpened state aid guidelines in Europe, it is valuable to have detailed insight in the determinants for airport profitability. This paper fills in a gap in scientific research by presenting the most important traffic and financial determinants for airport profitability, since the majority of scientific literature on airport (financial) performance focuses on efficiency rather than on profitability. Comprehensive airport traffic and financial data for 125 airports in Europe, the United States (US), Canada, Australia and New Zealand for the period 2010–2016 have been used to estimate several fixed-effects panel data regression on profit margin. Among others, the results show evidence for the fact that an increasing share of transfer passengers affects an airport's profit margin. In addition, there is no sign of a general LCC effect and just limited evidence for the fact that the market share of specific LCCs affect airport profitability: only an increase in the market share of Southwest Airlines at major airports leads to lower profit margins. Moreover, a quadratic relationship between seasonality and profitability has been identified. It points at the existence of a certain optimal seasonality score. Below that tipping point, a decrease in seasonality leads to higher profit margins. On the contrary, a further reduction of seasonality after the tipping point leads to lower profit margins. This might indicate that no or limited seasonality is a result of capacity constraints and, in turn, leads to increasing operating costs related to congestion. Regarding financial variables, the results especially show significant positive effects of capital cost efficiencies on profitability. Those effects are especially large for airports in the US and for small regional airports. Labour productivity only plays a important role in the profitability of US airports. Finally, the results show that regional O/D airports largely depend on regional economic development and population growth, while the major airports rather depend on global economic development than on an increase in local demand.

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## 1. Introduction

Increasing airline competition, mainly because of the influx of low-cost carriers (LCCs) the past 25 years, has substantially altered the airport playing field. On the one hand, it has provided growth opportunities for many airports (Carlisle, 2015; Huderek-Glapska and Nowak, 2016). On the other hand, because of the ongoing airline (especially LCCs) focus on lower costs, airports have more and more been forced to generate alternative sources of income next to the aeronautical revenues

E-mail address: [j.zuidberg@seo.nl](mailto:j.zuidberg@seo.nl)

(Fasone et al., 2016; Graham, 2009; Moulds and Lohmann, 2016). After all, airport charges form up to almost 20% of an LCC total operating costs. For network airlines this share is substantially smaller (Zuidberg, 2014). Especially at secondary airports, dominant airlines are often able to negotiate favourable charges in return of traffic. In turn, airports try to maximize non-aeronautical revenues from this additional traffic to make up for lower aeronautical revenues. The fact that aeronautical as well as non-aeronautical revenues are both to a large extent dependent on traffic volume results in a rather limited degree of market power in pricing aeronautical charges, to avoid negative consequences for the non-aeronautical side (Vogel, 2016).

Simultaneously, privatisation has led to an increasing focus on an airport's financial performance (Carlisle, 2015; Vogel, 2016). Additionally, also (local) governments are tending towards a more critical view on the benefits and detriments of airports, rather than viewing them as a source of prestige. This especially holds for (smaller) regional airports. Local authorities are increasingly aware of an airport's (financial) viability next to its economic advantages for the surrounding area. Moreover, in Europe, the European Commission has issued new guidelines for state aid to airports in February 2014. These guidelines allow for operating aid to airports with less than 3 million passengers annually for a transitional period of "only" ten years (European Commission, 2014). After that period, operating aid is not allowed anymore. Combining the current temporary state aid possibilities with the increasing awareness of an airport's viability, might lead to a reducing willingness among regional public authorities to provide financial support to airports.

Given the increasing focus on the financial performance of airports, the growing pressure on aeronautical revenues and the sharpened state aid guidelines for airports, it is valuable to have insight in the most important determinants for airport profitability. The results of this paper offer such insight. It presents the results of fixed-effects panel data regression analyses, identifying the key drivers for an airport's profit margin, operationalised as the operating margin, i.e. earnings before interest and taxes (EBIT) as a percentage of the operating revenues. The results shed light on the possibilities to increase the profitability of an airport. The findings presented in this paper are relevant for airport managers, stakeholders and regional public authorities.

## 2. Literature review and hypotheses

The majority of the existing scientific literature on airport performance focuses on the (operational) efficiency of airports, which obviously is related to an airport's profitability. Merkert and Mangia (2014) find that efficient airports are also profitable and vice versa. Moreover, Vogel (2016) stresses that operating efficiency, among others, is essential for financial success and Fageda and Voltes-Dorta (2012) mention that revenue inefficiency affects the profitability of small airports. Also in other sectors the positive relationship between efficiency and profitability has been demonstrated (see e.g. Trujillo-Ponce, 2013). Still, standardised efficiency measures are often hard to translate into tangible profitability figures. Therefore, the results of this paper fill in a scientific gap by identifying the most profound variables that influence airport profitability. The remainder of this section outlines the existing literature related to this subject and derives relevant hypotheses.

Several scholars point out that an increase in traffic volume leads to higher airport profits (Abbruzzo et al., 2016; Fageda and Voltes-Dorta, 2012; Fernandes et al., 2014; Hamzaee and Vasigh, 2000; Kato et al., 2011; Vogel, 2016), lower average costs (Bottasso and Conti, 2012) and higher efficiency (Fasone and Zapata-Aguirre, 2016; Pathomsiri et al., 2008; Pavlyuk, 2016), witnessing the existence of economies of scale in the airport business (see e.g. Vogel, 2016). Fernandes et al. (2014) find a threshold value of 3 million passengers for an airport to operate profitable in Brazil, while Kato et al. (2011) find a similar threshold of 2.7 million passengers in the Japanese airport sector. Vogel (2016) mentions 1 million passengers to be sufficient to operate profitable in an analysis of worldwide airports, while Fageda and Voltes-Dorta (2012) conclude that only airports with less than 500,000 passengers would incur financial losses if revenue inefficiencies would not exist. In addition, for North American airports, Hamzaee and Vasigh (2000) estimate that a 1% growth in passengers leads to a 0.071% growth in the revenue-cost ratio (RCR). Moreover, they find that a 1% increase in commercial passenger aircraft landings leads to a 0.01% growth in the RCR, while a similar increase in cargo aircraft landings results in a 0.052% growth. This suggests that cargo aircraft landings are more profitable for airports than commercial passenger aircraft landings.

The role of LCCs on airport operations has elaborated on by many authors as well. The majority points at the shift from aeronautical revenues to non-aeronautical revenues (Fasone et al., 2016; Francis et al., 2003; Gillen and Lall, 2004; Graham, 2009; Moulds and Lohmann, 2016; Njoya and Niemeier, 2011) as a result of an increasing share of low cost carrier operations. With respect to financial consequences for airports, Castillo-Manzano (2010) finds that LCC passengers spend 7% less at airports. On the other hand, it has been demonstrated that LCC traffic increases an airports' ability to control costs, because of their limited infrastructure demands (Martín et al., 2013). These findings are confirmed by Graham and Dennis (2007) and Lei and Papatheodorou (2010), who conclude that airports with high proportions of LCC traffic tend to have lower unit revenues, but also lower unit costs since LCCs have limited infrastructural requirements. Abbruzzo et al. (2016) conclude that results regarding LCC presence on the financial performance of airports in Italy are heterogeneous. Moreover, Gillen and Lall (2004) and Huderek-Glapska and Nowak (2016) point at the reduced bargaining power of an airport if it is dominated by a single LCC. In line with this, Barrett (2004) mentions that airports in negotiation of LCCs will be immediately aware that there is no prospect of achieving the aeronautical revenues achieved by hub airports dominated by network airlines. On the contrary, Merkert and Assaf (2015) conclude that airports with a high share of low cost carrier seats in the total number of seats have a better efficiency score. The authors have used a single efficiency measure based on profitability, quality and traffic output. The positive effect of LCCs on airport efficiency has been confirmed by Coto-Millán et al. (2014). However,

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