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A new era for airport regulators through capacity investments

Juan Carlos Martín [1], M. Pilar Socorro *

Applied Economic Analysis Department, Universidad de Las Palmas de Gran Canaria, 35017 Las Palmas de Gran Canaria, Spain

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ABSTRACT

Private and public airports' optimal actions may not coincide. While private airports usually pursue profit maximization, publicly owned airports look for maximum social welfare. Thus, the prices charged by private airports may differ from the socially optimal charges and public intervention may be needed. In this paper, we analyze airport charges when an increase in frequency produces positive or negative externalities and carriers have market power. We use the methodology of game theory to show that there may exist a level of capacity for which private and social objectives coincide, so no price regulation is needed. Thus, the usual role of regulators and planners could be modified in order to decide the appropriate capacity investments for which airport regulation is no longer necessary.

1. Introduction

Until the late 1980s, most airports were owned by national or local governments. However, in 1987, the three airports in the London area (Heathrow, Gatwick, and Stansted) and four other major airports in the United Kingdom were privatized. Following the British tendency, many other airports around the world have already been or are in the process of being privatized (Oum et al., 2004).

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There is a long debate in the literature about the optimal regulation policy in airports. Different countries use different forms of price regulation, though we can mainly distinguish two of them: price-cap and rate-of-return regulation. There are several papers in the literature discussing the optimality of one policy over the other, and there is no agreement on the optimal regulation policy (see, for example, Forsyth, 2002; Gillen and Morrison, 2001; Starkie, 2001; Zhang and Zhang, 2003).

In the controversial discussion about the optimal regulation policy, some authors go even further claiming that airport regulation may be completely unnecessary (see Beesley, 1999; Starkie, 2001). Beesley and Starkie follow a similar argument which is based on the complementary nature of the demand for different airport activities. Some commercial activities may enjoy locational rents, giving airport managers the proper incentives to behave in an economically efficient manner. For a profit-maximizing airport operator with market power that sells in both markets (core aeronautical and commercial services), the aggregate effect of the demand complementarity will attenuate the normal downward pressure on profits that arise when airports only run aeronautical services. This means that, as long as an airport combines both runway and retailing activities, airports' incentives will be to set charges lower than if runways were a stand-alone facility. An increase in the

* Corresponding author. Tel.: +34 928 45 9605; fax: +34 928 45 81 83.
E-mail addresses: jcmartin@daea.ulpgc.es (J.C. Martín), psocorro@daea.ulpgc.es (M.P. Socorro).
[1] Tel.: +34 928 45 8189; fax: +34 928 45 81 83.

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demand for flights from a particular airport will also increase the demand for the retailing activities at that airport. Thus, in Beesley's terms, the better the location, the greater the locational rents and the higher the airport managers' incentives to ameliorate charges levied on passengers and airlines. This concept is known in the literature as the landlord-airport. Just as a retailing property in prime shopping streets commands high rents from a superior location, retailing outlets at any busy airport can achieve high returns for the landlord. And, because retailing and property activities gain these superior locational rents, increases in traffic volumes at these airports will often produce significant increases in their profitability. In this paper, we will show that even if we consider only the aeronautical side, price regulation may not be needed.

Airport regulation is usually exerted limiting the airport charges that operators can levy on different users. Airport aeronautical revenues include landing, take-off, and parking of aircraft fees, and other aeronautical charges, such as for air traffic control or airbridges (these kinds of charges are supported by airlines); and charges for handling of passengers through terminals (which are directly paid by travellers). Traditionally, airports have viewed the airlines as their primary customers, while passengers have been perceived as part of the airlines business. However, this traditional airport–airline–passenger relationship is changing, and airports are placing more emphasis on non-aeronautical revenues, such as passenger spending in the terminals and car parks (see Francis et al., 2004). If the airport is not subject to any price regulation, then airport managers have a degree of discretion with respect to the level of each individual charge and the relationship between them.[2]

We are still far way from having a complete picture of airport regulation, but it is clear that regulators are obliged to perform this economic regulation in a manner that protects the reasonable interests of society (considering the promotion of economic efficiency of airports businesses and taking into account the investments). Given the increasing number of private airports, it is crucial for regulators to determine in which circumstances it is necessary to regulate them or not.

In this paper, we analyze airport charges when there is congestion and carriers have market power. We show that even in the absence of commercial services in the airport, there may exist an airport capacity for which private and social objectives coincide, so no price regulation is needed. Our results suggest that the discussion of optimality in airport regulation could be changed to a new one in which new airport investments could promote economic efficiency, making the need for regulation unnecessary. Of course, efficiency criteria can play only a limited role in the allocation of airport investments in those cases where airport investments are made taking into account other type of objectives such as national cohesion and political factors. Castells and Solé-Ollé (2005) analyze the main determinants of the regional allocation of infrastructure investments in Spain, concluding that both specific regional infrastructure needs and political factors appear to be factors that do explain the regional allocation of infrastructure investments. Feldhoff (2002) shows how the peculiarities of the Japanese airport system cannot be explained merely on the basis of the country's natural geography and regional economic characteristics but on the interaction and interests of the agents of the "iron triangle" (the politicians, ministerial bureaucrats, and businessmen), who determine Japan's airport policies.

Even in a context of scarce capacity, an increase in the frequency may produce two opposite effects. On the one hand, passengers have a preferred departure time and dislike the "schedule delay", which is equal to the difference between the actual and preferred departure time (see, for example, Basso, 2007; Brueckner, 2004; Panzar, 1979; Schipper et al., 1998). Increases in frequency reduce the schedule delay and, hence, consumers' generalized price. Some authors argue that this positive effect of frequency on consumers' generalized price is similar to the Mohring effect that is usually applied in the bus industry (Mohring, 1972). See Betancor and Nombela (2002); Pels and Verhoef (2002) for a further discussion. There is also another type of argument which has been used by Mayer and Sinai (2006), and it is more associated with the network benefits resulted from hub and spoke systems. They explain how one new round-trip flight from a hub airport where an airline already connects to N cities will create $2N$ additional connecting routes. Thus, a hub carrier has an incentive to serve an ever greater number of markets. These increasing returns to scope are offset by the limited flight capacity of airports, so a hub airline must trade off the higher benefits of serving additional markets against rising marginal congestion costs due to more traffic, such as longer connecting times and greater delays.[3]

On the other hand, as the frequency increases, the congestion raises and the delay cost increases (see, for example, Carlin and Park, 1970; Zhang and Zhang, 2006). Most papers in the literature consider either the first or the second impact.[4] Very few authors include both effects simultaneously (see for example Basso, 2007; Pels and Verhoef, 2002), though all of those authors consider that such effects are independent from each other. In this paper, we consider that an increase in the frequency produces both a decrease in the schedule delay and an increase in the delay cost. However, as a main novelty, we consider that both effects are fully connected through the airport capacity. In particular, we consider that if the airport capacity is high enough, the reduction in the schedule delay dominates, while if the airport capacity is not sufficiently high, the increase in the delay cost dominates. Thus, depending on which effect dominates, an increase in the frequency might have a positive or a negative effect on consumers' travel time and, thus, on consumers' generalized price.

Brueckner (2002a) and Zhang and Zhang (2006) show that congestion costs are internalized when carriers have market power. In this paper, we extend these results showing that whenever this happens, carriers also internalize the positive

[2] However, in practice, this discretion is limited by the pressures that other agents, such as airlines, governments, and trade or consumer associations, exert on the airport operator.

[3] In addition to the "schedule delay", an increase in frequency may reduce consumers' generalized price since indirect flights may be substituted by direct flights (Betancor and Nombela, 2002).

[4] Viauroux (2007) shows how the traveller's decision is influenced by his aversion to congestion as well as by other characteristics of the dynamics of congestion on the network, prices, service quality, and the other travellers' socioeconomic characteristics.