



## Supply side substitutability and potential market power of airports: Case of Amsterdam Schiphol<sup>☆</sup>

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### ABSTRACT

This study evaluates the issue of market power of Amsterdam airport Schiphol, focusing on the substitutability between this airport and nearby gateways. We focus separately on substitutability with respect to origin-and-destination passengers, and transfer passengers. These two types of passengers represent different markets in terms of both geographical boundaries and competing airports. Analysis of Official Airline Guide data, along with the information obtained during the interviews with stakeholders, clearly demonstrate that Schiphol has a potential to exercise its market power on both markets we identified.

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### 1. Introduction

Airports worldwide have traditionally been viewed as infrastructure objects rather than firms. This view has been challenged since the 1980, and airports have been increasingly recognized as full-fledged business enterprises that provide a number of different services to airline industry customers (Doganis, 1992; Winston and de Rus, 2008; Starkie, 2008). Despite the increasing potential for airports to be innovative businesses that provide services beyond take-offs and landings (e.g., parking, concessions, retail and other related services), it must be recognized that airports generally exhibit many of the classic properties of local monopolies. Thus, the issue of potential abuse of market power gains importance; but studies of airport market power are still at their infancy. In this study, we develop a methodological approach to identifying the markets an airport operates on; and evaluate the supply-side substitutability of Amsterdam airport Schiphol from the point of view of the commercial airlines serving origin-and-destination and transfer passenger traffic. Geographically, the relevant market is outlined by Schiphol's catchment area. If this area does not overlap

with that of another airport capable of providing access to the same kind of infrastructure Schiphol offers, we can say the airport is indeed a local monopolist.

For the purposes of this study, we view airport as an entity that provides infrastructure airlines need to perform their operations (land, park, service the aircraft, deplane and enplane passengers and/or cargo, and ensure the aircraft departs to its destination). Based on likely differences in both the nature of the service, and its substitutability, we suggest that the following four markets can be delineated. First, an airport provides services to the airlines serving origin-and-destination passenger traffic. This market is different in some important dimensions from the market for provision of infrastructure to the airlines serving transfer passenger traffic. The other two markets include infrastructure provision for cargo and instructional flights. Available data allows us to evaluate the extent of supply-side substitutability between Schiphol and competing airports on the first two markets. We demonstrate that Amsterdam airport Schiphol is clearly the dominant provider of the infrastructure to the airlines carrying origin-and-destination traffic to/from the area. Also, connections only via Schiphol are available for about 40 percent of all markets with connecting services via Amsterdam or its main competitor hubs, suggesting a potentially strong position of the Amsterdam airport on the market for provision of infrastructure to the airlines carrying transfer traffic.

Up to now, the governments' response to the potential exercise of market power by the airports has normally been to subject them to regulation, in a similar fashion to other natural or local monopolies, such as utilities. Some airports (most prominently, smaller UK airports, as well as most of the airports in Australia and

<sup>☆</sup> This paper is based on our earlier report that was commissioned by the Netherlands Competition Authority, NMa as part of the evaluation of the Dutch Aviation Act, See Mueller, Juergen, Volodymyr Bilotkach, Frank Fichert, Hans-Martin Niemeier, Erich Pels, and Andreas Polk (2010). The economic market power of "Amsterdam Airport Schiphol", Study commissioned by the Netherlands Competition Authority (NMa).

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Switzerland) are however allowed to set their charges as they see fit, subject to monitoring by the authorities, presumably enforced by the threat of re-regulation or by general antitrust rules on the abuse of dominant positions as ex-post regulation. The decisions to deregulate the airports are however often made without much regard to the issue of potential market power. This underscores the need for a framework for analyzing market power of airports, along with studies employing such framework in practice. A recent paper by Polk and Bilotkach (2011) contains a thorough review of issues to be considered when evaluating airport market power; our study takes a part of that framework to the data.

The literature on the economics of airports consists of the following strains. First, we see a number of largely descriptive studies of airport regulation. Forsyth et al. (2004) provide a comprehensive overview of the relevant history and practice. In addition to descriptive studies, we also see theoretical scholarship tackling some of the salient issues regarding airports. For example, Czerny (2006) and Yang and Zhang (2011) consider the optimal form of airport regulation, while Brueckner (2002) and Basso and Zhang (2008) explore the airport–airline relationship concerning aeronautical charges in the peak/off-peak context. The existing empirical literature on airports consists mostly of benchmarking studies that examine the factors determining airport productivity (e.g., Oum et al., 2003; Oum and Yu, 2004; ATRS, 2008; Perelman and Serebrisky, 2010; Liebert and Niemeier, 2010; Adler and Liebert, 2011). Additionally, three studies (van Dender, 2007; Bel and Fageda, 2010; Bilotkach et al., 2011) focus on determinants of airport charges. In particular, Bel and Fageda find that private unregulated airports in Europe exhibit higher aeronautical charges as compared to the public regulated ones.

The rest of this paper is organized as follows. Section 2 discusses the issue of market definition. Section 3 describes data and methodology. Sections 4 and 5 implement the data analysis. Section 6 discusses a related issue of the role of high-speed rail. Section 7 concludes.

## 2. Market definitions

The framework for defining markets airport operates on is discussed quite extensively in Polk and Bilotkach (2011). Overall, the relevant concepts to consider when delineating market boundaries are substitutability and geographical boundaries. The former defines markets in the product space while the latter – in geographical terms.

On the aeronautical side, the main product an airport provides to its customers (airlines) is the infrastructure for take-offs, landings, passenger enplanement/deplanement, cargo loading/unloading, etc. Substitutability in this context refers to answering a simple question of whether the airlines have an alternative potential provider of the same infrastructure, which would allow them to operate the same or very similar network, in case the current airport decides to increase price for its services. Geographical market boundary is defined through the concept of an airport catchment area, or the geographical area where airports' customers (passengers or cargo forwarders) originate. The general approach to further delineating boundaries of the markets on which an airport operates involves determining whether different services provided by the airlines to their final customers are substitutable within the airport; outlining catchment areas for each of those services; and determining whether these catchment areas overlap with same for other airports capable of providing equivalent infrastructure to the airlines. Let us consider these issues in more detail, as they apply to Schiphol.

The concept of substitutability between goods A and B implies that if price for good A increases, demand for good B will increase, so there is a clear positive correlation between the two. When the two

goods are highly substitutable, we can say they belong to the same market. In the airport context, one can think of the “goods” as the types of service provided by the airlines to their final customers rather than the generic infrastructure for take-offs and landings. After all, airport often prices use of its infrastructure differently, depending on the type of service performed by the airline. For instance, per passenger charges at Amsterdam Schiphol are significantly higher for origin-and-destination than for transfer passengers.

Broadly speaking, airport infrastructure is used by the airlines to transport origin and destination passengers, transfer passengers (in some airports), and cargo; some airports house general aviation and instructional flights. Cargo, general aviation and instructional flights clearly belong to separate markets. The key question to be addressed is then whether infrastructure provision for serving origin and destination passengers and transfer passengers belong to the same market. Indeed, passengers of the two types routinely sit next to each other on the airplane, suggesting that they might belong to the same market. However, a salient question here is whether the airport will be able to respond to higher charges for origin and destination passengers by increasing its share of transfer traffic. In case of AMS, the answer is clearly “no”, as illustrated by the ‘natural experiment’ with the passenger ticket tax in 2008, which only applied to origin and destination passengers. As a result of this tax, Schiphol airport is estimated to have lost about 1.4 million origin and destination passengers in the second half of 2008, while the number of transfer passengers handled by the airport remained nearly unchanged. Based on this fact, we have concluded that provision of infrastructure to the airlines serving origin and destination passengers represents a different market from provision of infrastructure to serve transfer passengers.

Catchment areas for the two markets identified above are also very different. Origin and destination passengers originate in or use the airport to travel to the area located in relatively close proximity to the airport premises. Airports and industry professionals use various techniques to delineate the catchment areas for origin and destination passengers; as a rule of thumb, this area encompasses locations from which the airport can be reached within 2 h. Catchment area for the transfer passengers is defined by the destinations where such passengers originate and terminate – encompassing, for a large hub, the entire world.

## 3. Methodology and data

The aim of our data analysis is to evaluate the degree to which market conditions can potentially constrain Amsterdam airport's market power. Two mechanisms can contribute to this. First, an airline may leave for an alternative gateway if it is not satisfied with the level of charges at Schiphol. Second, even if an airline may choose not to leave the airport, its customers may choose to do so. The customers may leave for either nearby airports or alternative modes of transport, which can undermine market power even if an airport is a local monopolist. This in turn will force the airlines to curtail their services, and can lead to lower revenues for the airport, despite the price increase. Understanding such a possibility, the airport may choose not to raise its charges. Thus, competition on the airline market may contain the airport's market power.

On the former mechanism, we must note that Amsterdam is by and large the most convenient airport for majority of origin and destination passengers originating from and traveling to Amsterdam or the surrounding catchment area<sup>1</sup>; thus other things equal airlines would prefer serving the area via AMS rather than any

<sup>1</sup> This airport is located close to the city of Amsterdam; and has frequent direct rail services to both Amsterdam and other cities in the Netherlands.

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