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The origin–destination airport choice for all-cargo aircraft operations in Europe

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ABSTRACT

In this paper, we analyze the origin–destination airport choice for freighter operations of combination and all-cargo carriers in Europe. First, we discuss the choice process of airlines qualitatively. Next, using a stated choice experiment, we show that the presence of forwarders at an airport is the primary factor in explaining airlines' choices, especially for airlines serving main airports. For airlines primarily serving regional airports, the possibility for night-time flights is most important. Finally, the presence of passenger operations at an airport is not a significant factor and the level of origin–destination demand is of limited importance.

1. Introduction

During the last 35 years, air transport has known a strong growth. While from 1975 to 2012 passenger transport, measured in passenger kilometers, has been growing at a yearly average of 5.8%, cargo transport, measured in tonne-kilometers, has been growing at a yearly average of 6.2% (calculations based on ICAO data). Although this strong growth has been tempered by the economic downturn, airports still play an increasingly important role in economies around the world. Many economic impact studies of air transport, mostly on country or airport level (see, e.g., Hakfoort et al. (2001) and Kupfer and Lagneaux (2009)), confirm this increasing importance for the creation of employment and value added. Moreover, on the global level, the impact of aviation is estimated to be 2.2 trillion dollar (Air Transport Action Group, 2012). The strong growth of air transport, on the other hand, also has negative impacts, such as congestion and (noise) pollution.

Because airports can be important for economies in the creation of value, attractive and competitive airports are desirable, especially from a government's point of view. As Starkie (2002) points out, the real market power of an airport depends on the market segment and the availability of other airports in the proximity. While airport competition and airport market power have already been discussed by numerous authors (see Forsyth et al. (2010) and Starkie (2008), for instance), they have mostly been associated with passenger transport. Concerning the competition for air cargo, very little research has been done so far. However, as air cargo transport is a relatively foot-loose business, airport competition for cargo can be quite fierce, especially in Europe, where main airports are often located within a few hours of driving from each other. Therefore,

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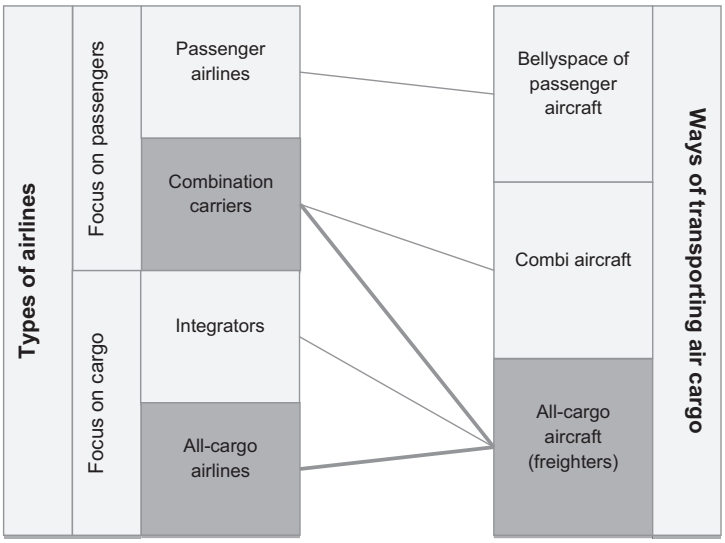

Fig. 1. Air cargo background and research scope.

a good understanding of the airport choice of cargo airlines is needed for airports and governments in order to be able to attract cargo airlines and thus economic activity.

In order to understand the background of our research as well as to be able to interpret the results, a closer look at the air cargo sector is required (see Fig. 1). In air transport, we distinguish different kinds of airlines. The first type of airlines are pure passenger airlines such as Ryanair, which only organize the transport of people. The second type consists of combination carriers which focus on passenger transport as well, but in addition also deal with the transportation of freight. Integrators (i.e. FedEx, DHL, UPS, TNT), the third type, as well as all-cargo carriers, the fourth type of airlines, focus on the transport of freight and are not involved with the transport of passengers.

Another distinction can be made based on the way in which cargo is transported. Cargo can, for example, be transported in the belly of a passenger aircraft together with the baggage of passengers. Alternatively, cargo can be transported in combi-aircraft which are aircraft in which cargo as well as passengers are transported on the main deck. Last, airlines can use aircraft dedicated to freight transport, i.e. so-called freighters or all-cargo aircraft.

From the mid 70s up until about 2005, the share of cargo transported in freighters (expressed in tonne-kilometers) grew from about 40–60% of overall air freight traffic. After 2005, this share dropped again, to about 50% in 2012 (calculations based on IATA data). Although carriers transport cargo in the belly of a passenger aircraft as well as in freighter aircraft, this article focuses on the airport choice for the latter as the airport choice for belly freight is to a large extent influenced by passenger operations. Furthermore, this study is restricted to the airport choice for freighter operations of combination carriers, as well as the airport choice of all-cargo carriers. Integrators such as DHL and FedEx are not included in our study as their business model is very different from that of the traditional carriers, and, therefore, the factors determining competition between airports are evaluated differently by integrators and combination or all-cargo carriers. Furthermore, only scheduled operations are studied, which, in contrast to non-scheduled or ad-hoc operations, are set up before the specific demand is known and involve airport decisions that are taken more independently. Based on data available through IATA on scheduled cargo traffic (tonne-kilometers) of 2012, we estimated that the scheduled all-cargo traffic excluding traffic by TNT, FedEx and UPS but not by DHL[1] covers about 35% of the worldwide overall air cargo traffic (IATA, 2013). Finally, this study mainly focuses on the choice for origin–destination airports rather than for hub airports. However, also large (cargo) airports like Amsterdam or London Heathrow can be considered non-hub airports for specific airlines which do not offer connecting services at those airports.

In this contribution, we aim to overcome the shortcomings in research concerning airport choice and the airport competition for cargo. We do so by using a stated choice experiment to quantify the importance of the factors driving the airport choice for freighter operations. In Section 2, we present the airport choice process as well as the factors that potentially influence the cargo carriers' choices. In Section 3, we describe the setup of the stated choice experiment, the data collected and the models used for analysis. In Section 4, we present the results of our stated choice analysis. Finally, we discuss the implications of our results for airports and policy makers.

[1] As DHL does not publish data concerning tonne-kilometers, this traffic could not be excluded in the overall share.