

## Cooperation between airports: A focus on the financial intertwinement of European airport operators

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### ABSTRACT

Recent airport cooperation initiatives and the lack of detailed research on the cooperation between airports suggest a research gap on this topic. The present study therefore investigates cooperative arrangements between European airports by focusing on their financial intertwinement. Social network analysis tools are used to examine the structural patterns of financial relationships in the airport sector, while a multiple regression quadratic assignment procedure (MRQAP) is applied to measure the impact of financial path dependency and spatial patterns on the occurrence of investment ties. The findings indicate a high degree of stability in investment relations in the airport industry over time. Furthermore, it is suggested that the formation of interorganisational linkages is facilitated by spatial proximity.

### 1. Introduction

All types of organisations, also airports, interact with other actors in their business environment and form inter-organisational relationships. Such relationships play an important role for the strategy of an organisation. The intensity of these interactions varies from cooperative arrangements to competition at the extreme (De Wit and Meyer, 2005).

Deregulation in the EU air transport market in the late 1980s and early 1990s did not only lead to cost and efficiency pressure for airlines but also for airports as a consequence. Moreover, government thinking on how infrastructure should be owned and operated changed over time. Therefore, in the last 25 years, airports have been developing from infrastructure provider to commercial enterprises. Recent examples show that airports are not only involved in competition, but more and more also in cooperative initiatives. First, they form networks with airlines (Macário and Van de Voorde, 2012; Schaar and Sherry, 2010). For example, terminal 5 at London-Heathrow was built specially for British Airways and its partners (Lopes, 2012). Second, cooperative agreements are also formed with infrastructure or service providers of other transport modes. At Milan Malpensa, the airport authority operates the train service (Lopes, 2012; Suski, 2011) and at Al Maktoum International Airport in Dubai, freight can be transported by plane to the final destination after having arrived by ship (Wilén, 2008). Third, airports are connected with other airports. One example is the connection between Amsterdam-Schiphol and Paris Charles-de-Gaulle

through the mutual shareholding (8%) of Schiphol Group and Aéroports de Paris (AdP) since 2008. Ultimately, airports are in contact with other stakeholders, such as (local) public authorities.

Literature about interactions of airports with other actors primarily concentrates on issues related to the competition of airports (see Barrett (2000); Forsyth (2003); Graham (2004, 2014a); Lian and Rønnevik (2011); Lieshout et al. (2016); Niemeier et al. (2012); Paul (2015); Pels et al. (2000, 2003); Starkie (2002)). Cooperation of actors in the air transport sector is less frequently addressed. Some recent studies include Bilotkach and Hüschele (2015), who examine the impact of airline alliances, Graham (2014b), who analyses privatisation in the airport sector, Merkert and Morrell (2012), who review airline mergers and acquisitions, Forsyth et al. (2011), who focus on the trend towards global multi-airport companies and Fu et al. (2011), who investigate the relationship between airports and airlines. Recent cooperative initiatives, paired with the lack of a systematic understanding of how airports cooperate, show the need to deepen the knowledge in this domain.

The objective of this paper is therefore to analyse the cooperation of European airports and, more specifically, their financial intertwinement. When referring to airports in this paper, the airport authorities or operators are briefly described. A recent report of ACI Europe (2016) on the ownership of Europe's airports reveals the shareholders of airports in different European countries. In this paper, this analysis is inverted by creating airport-by-airport matrices based on their engagement with

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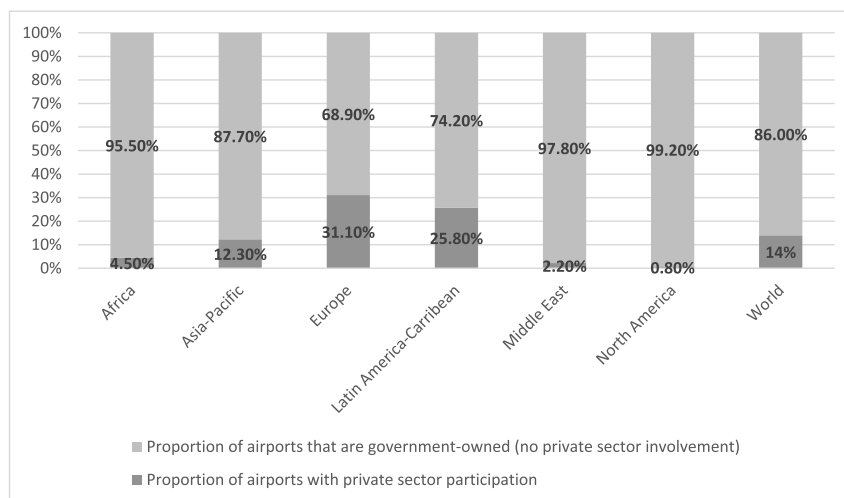


Fig. 1. Airports by ownership structure and region.

Source: ACI (2017, p. 5)

different shareholders, instead of looking solely at single airports and their financial partners. Subsequently, the structural and dynamic patterns of airports' financial intertwinement are examined. In which European airports do investment companies invest? Are these shareholder-airport relationships stable over time? These questions are answered in this paper by investigating the European airport network from the viewpoint of financial shareholders.

Data on financial participations in airports are collected to explore the structure and evolution of airport cooperation focusing on financial interrelations. Social network analysis is a widely accepted tool for analysing the structure and functioning of organisational networks (Wasserman and Faust, 1994). Consequently, it is employed here to analyse structural patterns of financial relations in the airport sector in depth. In addition, multiple regression quadratic assignment procedure is used to assess the impact of financial path dependency and spatial patterns on the occurrence of investment ties.

This study contributes to the literature on airport cooperation in three distinct ways. Firstly, while interaction between airports has mainly been addressed from a competition theory point of view, the aspect of cooperation is introduced in this paper. Secondly, it is novel to approach airport cooperation from a social network analysis perspective. Thirdly, the use of panel data provides new evidence about the evolution of airport networks.

The remainder of this paper is organised as follows. Section 2 gives insight into the ownership and governance of airports. Section 3 explains the methodology used in this paper. Section 4 deals with the empirical results. Section 5 offers some conclusions and recommendations.

## 2. Financial intertwinement as form of airport cooperation: ownership and governance

The term 'cooperation' is generally defined as "working together with others, whereby the objectives of two or more organizations are mutually beneficial" (De Wit and Meyer, 2005). In parallel, cooperation between airports can bring along potential benefits, such as shared knowledge and financial resources. Different types and degrees of cooperation exist, such as sister agreements, airport systems, non-legal recognized cooperation, financial intertwinement between airports etc.

A sister agreement, like the agreement between Munich and the airports of Beijing, Denver, Nagoya, Bangkok and Singapore (Graham, 2013) is rather a loose cooperation aiming to share best practices. In contrast, airport systems are a more serious form of cooperation. This is because they are often owned by the same shareholder/public entity.

However, cooperation without financial intertwinement often only has a limited influence on airports.

Section 2.1 gives an overview of airport ownership and governance. Next, airport operators and shareholder types are discussed in Section 2.2. In Section 2.3, the relationship between airport ownership and efficiency is addressed.

### 2.1. Airport ownership and governance

Until the 1990s, ownership of airports was in most cases in the hands of large incumbent airport authorities, such as BAA, Aéroports de Paris (AdP) and Fraport. However, a move towards privatisation of airports could be seen since the deregulation of the airline market in Europe. As a result, three main categories of airports can be distinguished: fully public, fully private or mixed owned (ACI Europe, 2016; Graham, 2014b).

Worldwide, about 14% of airports have private sector participation, while 41% of passenger traffic passes through airports with private sector participation (ACI, 2017). This means that the private sector mainly invests in larger airports as they have more chances of a high return. However, there are differences in the participation of the private sector between continents: 75% of passenger traffic in Europe is handled at airports with private sector participation and 60% in Latin America-Caribbean, while this is only 1% in North America. With regard to the number of airports with private sector participation, Europe and Latin America-Caribbean also take the lead with 31.10% and 25.80% respectively, while in North America less than 1% of the airports have the private sector involved (see Fig. 1).

Of the airports in Europe, about 59% are fully under public ownership in 2016, which signifies a significant drop from 78% in 2010. While public ownership has dropped since 2010, especially mixed ownership gained share with an increase from 13% in 2010 to 25.2% in 2016 (see Fig. 2).

In Europe too, it can be seen that private partners especially invest in larger airports: while about 41% of the airports in 2016 were under mixed or private ownership, almost three quarter of all passengers (73.5%) travelled through those airports (ACI Europe, 2016).

In the case of (partially) private ownership, shareholders can possess stakes in multiple airports, resulting in the financial intertwinement of the involved airports. Graham (2014b) identifies five types of privatisation, being share flotation on the stock market, trade sale (sale of the airport or parts of it to a partner/consortium), concession (right to operate airport for a specific period), project finance and management contracts (ownership remains with the government, only

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