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Competition for long-haul connecting traffic among airports in Europe and the Middle East

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ABSTRACT

This paper analyzes the competitive position of major hub airports in Europe and the Middle East for long-haul connecting traffic. We apply a connection builder to construct competitive flight connections. A stand out feature of the proposed connection builder is the calibration of the model parameters using booking data, composed of actual passenger demand between a given origin and destination (O&D) market. The methodology is applied to measure competition between hubs using flight schedule data to calculate connectivity measures like the number of city-pairs connected via a hub airport. Our results show that the Middle Eastern hubs have improved their competitive position, while the European hubs are more exposed to competition than their Middle Eastern counterparts.

Topic areas

Airline network development, airline strategy, airport strategy.

1. Introduction

Hub airports play a major role in the aviation system. Especially on long-haul city-pairs, connecting flights with a transfer at a hub offer potential passengers travel alternatives to nonstop flights between origin and destination. Many of the largest airports worldwide reach their passenger numbers because of the high share of connecting passengers resulting from the network and scheduling strategies of their home carriers. The rise of the big three Gulf carriers - Emirates, Etihad Airways and Qatar Airways - builds upon this business model. They connect city-pairs via their home bases in Dubai, Abu Dhabi, and Doha respectively. Turkish Airlines with its hub in Istanbul is a further fast-growing competitor to the European airlines for passengers on long-haul routes to Asia. As a result, the European hubs are losing market shares to the Middle Eastern hubs.

This paper aims to quantify the level of competition between the main European hubs and the Middle Eastern hubs including Istanbul for long-haul connecting traffic. Based on worldwide schedule data and a connection builder algorithm from previous research (Seredyński et al., 2014), we provide connectivity measures that allow to determine the level of competition among hubs and to identify key competitors for each of them. In addition, with data ranging from 2009 to 2015 we analyze how the competitive landscape has changed over the last years. This expands a previous quantitative assessment of the level of competition between the five biggest European hubs and the Gulf hubs (Grosche and Klophaus, 2015). The current contribution represents a major enhancement by (a) extending the list of investigated hubs, (b) using a longer time series for the trend analysis and more recent data, and (c) applying a new methodology for connection building. Furthermore, the relative importance of city-pairs is weighted with passenger numbers.

There is published work on the rise of the Gulf carriers during the last decade and the underlying business model (O'Connell, 2011). Other researchers have dealt with the Gulf carriers' network development (Hooper et al., 2011) and reasons for comparative cost advantages (De Wit, 2014). Squalli (2014) studied the relationship between the openness of air travel markets and the performance of Emirates concluding that liberalization leads to

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higher passenger numbers, lower fares and, ultimately, welfare gains. Several researchers studied how the Gulf carriers have reshaped traffic flows. Grimme (2011) analyzed the impact on traffic flows between secondary airports in Germany and Asia. O'Connell and Bueno (2016) looked more broadly at traffic flows between East and West to evaluate the hub-and-spoke system efficiency of the three main Gulf carriers. Their research findings indicate a higher degree of connectivity and temporal coordination for Gulf carriers compared to their European counterparts. Dresner et al. (2015) studied the impact of Gulf carrier competition on U.S. airlines. Their results suggest that the Gulf carrier entry in the U.S. is associated with significant traffic growth on routes between the U.S. and the Middle East and small but statistically significant traffic losses and fare reductions for U.S. carriers in beyond markets (i.e., sixth freedom traffic) connecting the U.S. with Africa, Asia, Australia and Europe. Incumbent Asian carriers also compete head-to-head with Gulf carriers in international markets. Fan and Lingblad (2016) analyzed the potential for Singapore Airlines to respond in terms of market scope and product characteristics. They suggest a budget business product and a premium economy cabin as potentially viable strategic options.

Another stream of research relevant to our paper is the work done on measuring air transport connectivity and the performance of airline networks. Some initial assessment of the competitive position of airports and airlines is possible with size-variables such as the number of passengers. However, these traditional indicators do not provide all necessary information when airlines not only compete on direct routes from A to B, but also indirectly with a transfer at a hub from A to B via hub H (Lieshout and Burghouwt, 2013). Burghouwt and Redondi (2013) provide an overview on air transport literature that accounts for both, direct and indirect connectivity, by introducing connectivity measures. These measures allow to examine a wide range of air transport network issues, such as the competitive position of hub airports concerning major traffic flows like the transatlantic market (Burghouwt and Veldhuis, 2006) or even worldwide (Redondi et al., 2011), the development of multi-hub airline networks (Li et al., 2012), dehubbing of airports due to airline network reorganization (Redondi et al., 2012), and the connectivity of regional air transport markets (Suau-Sanchez and Burghouwt, 2012). More recently, Burghouwt (2014) analyzed how the new Middle Eastern hubs influence European multi-hub airline networks, and Logothetis and Miyoshi (2016) studied hub performance and efficiency with Turkish Airlines and Emirates as a reference. Suau-Sanchez et al. (2016) have used a connection builder in conjunction with MIDT to assess the potential for self-connectivity and the quality of these connections.

Research on airline networks and connectivity typically makes use of connection builders (CBs). CBs are algorithms that construct flight connections from schedule data using a set of rules and parameters, typically based on connection time and detour factor. Various authors proposed more complex metrics combining these two parameters in various ways, including varying penalties of transfer vs. in-flight time (e.g., Veldhuis, 1997; Burghouwt and Veldhuis, 2006) and decomposition of the in-flight time to detour and direct distance components (Seredyński et al., 2014). A recent overview of CB approaches and parameter settings is given by Logothetis and Miyoshi (2016). In the present paper we use the CB proposed by Seredyński et al. (2014). This CB was calibrated with booking data from MIDT (marketing information data tapes), making it possible to better identify the connections that were actually chosen by passengers. This is a stand out feature to related research in which CB parameters values are fixed by the authors' discretion. Logothetis and Miyoshi (2016) correctly mention that the exclusive reliance on schedule data is a limitation to their analysis and that the real commercial value of connections can only be established if passenger demand data are used in conjunction with flight schedules. This has been accomplished by Suau-Sanchez et al. (2016) adding MIDT data to their analysis to assess the quality and drivers of travel itineraries based on self-connections by passengers. In our approach origin and destination traffic data estimations are incorporated to better assess the importance of transfer city-pairs.

Using the methodology described below, we give the number of competitive connections and city-pairs offered at thirteen main European hubs, the three Gulf hubs and Istanbul, the share of city-pairs per hub offered without competition as well as the percentage of transfer city-pair overlap between these hubs. Further, we

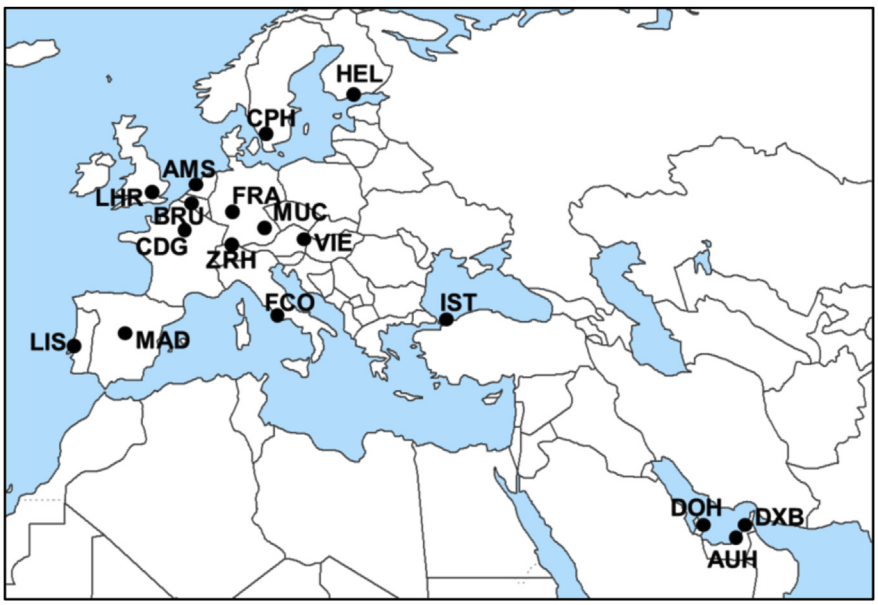

Fig. 1. Focus hubs included in the study.

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