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THE DEVELOPMENT OF THE COMPETITIVE POSITION OF AIRLINES IN THE NORTH ATLANTIC MARKET

Extended Abstract

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INTRODUCTION

The North Atlantic is the largest intercontinental aviation market globally, accounting for 3.2 Mio passengers each way in the year 2016. While post-9/11 capacity reductions, mergers and joint ventures (1) fostered market consolidation, recent years saw the inauguration of new routes, including those by new "long haul low cost" ventures (2) like Norwegian or Wow Air. Given these developments, we assume the competitive positions (CP) of the airlines operating on the transatlantic to have changed over time and to be generally lower (i.e. more exposed to competition) now than in the Noughties. For this, we define a carrier's competitive position as the relative market position it occupies in its whole network (see e.g. (3)).

However, quantifying an airline's competitive position is not trivial as carriers compete not only at the direct route level but serve many different origin-destination (OD) markets with varying degrees of direct or indirect competition (4). At the end of the day, networks compete against each other. For example, the relative CP of a particular carrier on a route from O to D will not only depend on its own performance on this route in relation to other airlines' direct flights, but also on the indirect supply from O to D via any hubs H.[1] "Traditional" competition assessments at the national, airport- or direct route-levels, usually applying the Hirshman-Herfindahl index (HHI) as in (5), (6), (7), or (8), do hence not reflect the whole picture (5).

This paper applies a modelling approach capable of assessing the individual CP of airlines at their whole network (OD) level to the transatlantic market. The approach, which was already applied to intra-Europe in an earlier paper (9), considers an airline's actual market share on each single OD and the relative contribution of each OD to the airline's total passenger numbers. The model requires OD traffic flow data as input and provides an indicator for the airline's CP as output.

The results for four selected years between 2002 and 2016 indicate volatile, but generally decreasing CPs in the long run, as well as higher CPs (0.35-0.6) for geographically specialized airlines and for dedicated leisure carriers. The CPs of the biggest European full service network carriers (FSNC) are "in the same league"(0.25-0.35) as those of the largest US carriers, indicating a quite balanced distribution of market power.

This network perspective is not new, but most of the earlier work in this field either tackles the role of network competition from a pure theoretical or conceptual perspective ((10), (11)) or focused on the US domestic market (e.g. (5)). The approach is considered to be of relevance e.g. for policy makers or investors and could also be applied e.g. in analyses to be conducted in the context of cartel decisions.

METHODOLOGY

To assess a carrier's CP, we consider all ODs on which this airline carries passengers. We define the overall, network-wide competitive position (CP_i) of a carrier i as the sum over all of its OD-specific market shares (MS_{ij}) in its OD markets j multiplied by the relevance of each OD_j, which can be proxied by the number of passengers of airline i on OD_j (PAX_{ij}) divided by the airline's total passenger number PAX_i (equations (1) and (2)).

$$CP_i = \sum_{j=1}^{n} (MS_{ij} * PAX_{ij} / PAX_i) \quad (1)$$

$$\text{where } MS_{ij} = \frac{PAX_{ij}}{PAX_j} \quad (2)$$

If no other airline carried passengers on the same ODs, all market shares MS_{ij} as well as the carrier's total CP would amount to 1. The carrier would then be free from any intra-modal competition. If all OD-relations were dominated by other carriers, its CP would be close to zero.

OD-level Passenger volumes are provided by the Sabre Market Intelligence (MI) database (12) which relies on validated raw booking data, supplemented by data from external sources and estimates for direct

[1] Not considered here are is competition from alternative airports, or from other modes of transport.

bookings and charters. The North Atlantic market is defined as demand between the Sabre-regions "Western Europe" and "North America".

Using MS Excel, the analysis is run with available datasets for the years 2002, 2009, 2012 and 2016, to reflect different time-points over the last 15 years. To scale the massive amount of data down and to reflect the idea that several airports serving one city may be exchangeable, we perform the analysis at the city-to-city-level.

Also, we have chosen the month of September as reference and not the respective full year. This also helps reducing the sample size and is unlikely to bias the results as the month of September is usually characterized both by solid business and leisure demand and hence supposed to be a good proxy for the annual average. Finally, only one-way ODs are considered, as the market shares on the return segments from North America to Western Europe are likely to be very similar.

FINDINGS

Table 1 and the subsequent figures report the development of the CP for all 26 airlines that appeared among the Top 20 of the largest carriers (in terms of September passenger totals) on the Western Europe-North America axis in any of the years 2002, 2009, 2012 or 2016.

TABLE 1: CPs of largest transatlantic airlines, 2002-2016

IATA Code	**Carrier Name**	**Competitive Position**			
		2002	**2009**	**2012**	**2016**
AA	American Airlines	26%	26%	22%	25%
AB	Air Berlin	Not yet active	36%	48%	33%
AC	Air Canada	49%	39%	40%	39%
AF	Air France	25%	28%	34%	23%
AY	Finnair	25%	39%	46%	39%
AZ	Alitalia	41%	34%	34%	28%
BA	British Airways	27%	24%	28%	26%
CO	Continental Airlines (now part of United Airlines)	22%	29%	Exit	Exit
DE	Condor Flugdienst	41%	62%	59%	51%
DL	Delta Airlines	34%	34%	33%	30%
DY	Norwegian	Not yet active	Not yet active	Not yet active	36%
EI	Aer Lingus	55%	29%	46%	37%
FI	Icelandair	38%	46%	46%	34%
IB	Iberia	36%	41%	33%	27%
KL	KLM	26%	27%	27%	22%
LH	Lufthansa	32%	30%	34%	30%
LX	Swiss	31%	27%	36%	31%
MT	Thomas Cook Airlines UK	Data missing	57%	Data missing	46%
NW	Northwest Airlines (now part of Delta Airlines)	25%	28%	Exit	Exit
OA	Olympic Airlines	57%	42%	9%	Exit
SK	SAS	44%	39%	41%	35%
TP	TAP Air Portugal	54%	55%	43%	36%
TS	Air Transat	34%	45%	53%	48%
UA	United Airlines	31%	27%	31%	26%
US	US Airways (now part of American Airlines)	26%	35%	35%	Exit

VS	Virgin Atlantic	38%	41%	39%	29%

Figure 1 illustrates the development of the CP of the largest North American and European FSNC. The US carriers seem to have lower competitive positions than Air Canada AC. One reasons for this might be that, for Canadian destinations, flights with US carriers make no suitable alternative for various reasons (detour, passport, baggage through-check and visa issues…). This leaves only selected European carriers as competitors for Air Canada, while US carriers have to share the market both between themselves and with Air Canada and their European counterparts. The figure also indicates an overall decrease of the competitive position of all carriers in the long run, proving the hypothesis from the introduction, as well as an increase of United Airlines' potential market power between 2009 and 2012, which may stem from the merger with Continental Airlines.

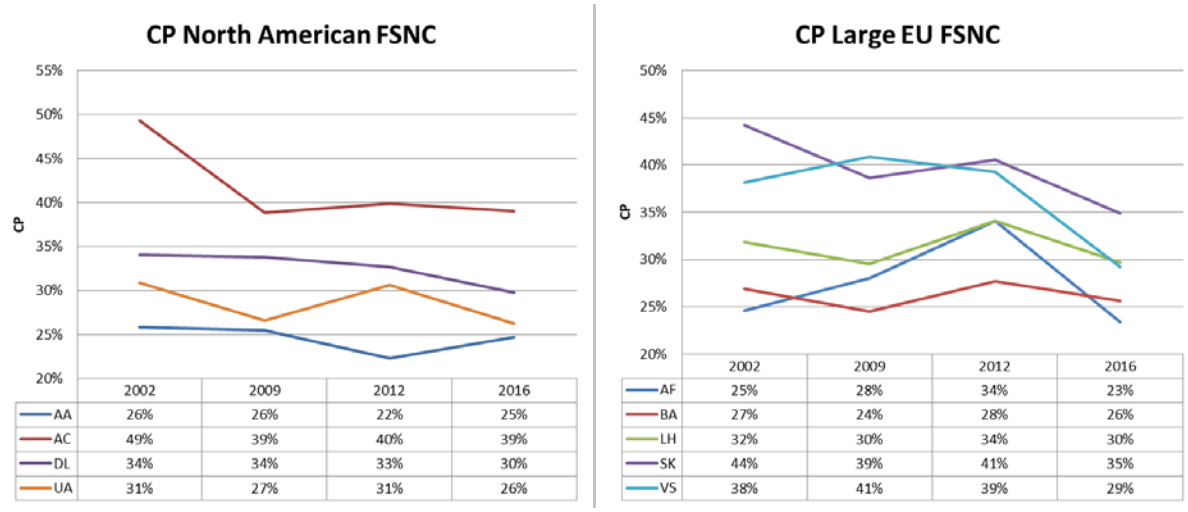

FIGURE 1: CP of largest North American and European FSNC, 2002-2016

The large European FSNC show similar patterns. First, all of their CPs declined in the long run, again indicating increasing competition. Second, the CPs of Lufthansa, Air France and British Airways are "in the same league" as those of the US carriers, indicating a quite balanced distribution of market power. Third, more specialized carriers like SAS SK and Virgin Atlantic VS tend to have higher CPs, comparable to Air Canada. In the case of SAS, this might be related to the geographical location of many European origins in Northern Europe which are quite badly connected via the large European hubs. Virgin Atlantic, in contrast, is specialized on nonstop routes between London and North America and hardly offers any intra-European feeders. This makes the airline less exposed to competition via other hubs. The sharp decline of Virgin's CP between 2012 and 2016 might be related to the increase in direct flights between London to the US, now also offered by LCC like Norwegian.

Figure 2 shows the CPs of selected "other" carriers: Leisure airlines Condor DE and Air Transat TS seem to be much less exposed to competition on the ODs they serve as the network carriers. This may lie in the fact that they tend to offer dedicated routes to leisure destinations which are usually not served by other carriers, and on which large shares of passengers may prefer the nonstop option for instance for reasons of convenience and comfort. Typical Condor destinations in the US are not the large airports and destinations, but Anchorage, Seattle, Portland or Austin. Despite of fluctuations, Irish carrier Aer Lingus also used to have a higher CP than the large FSNC, which may be caused by the fact that routings from Ireland to the US with European competitors would result in relatively large detours. Norwegian DY, with a CP of 36% in 2016, is new in the market and known as the first LCC flying transatlantic.

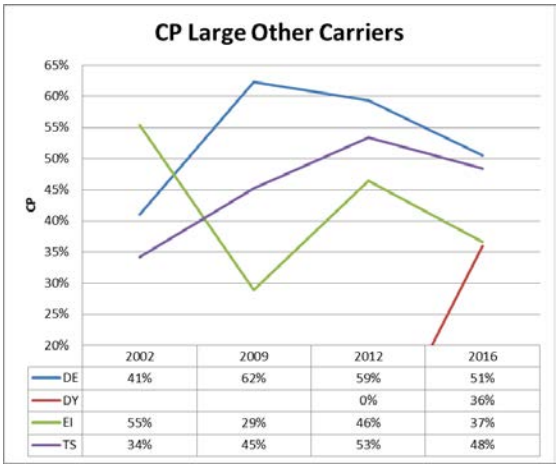

FIGURE 2: CP of large "other carriers", 2002-2016

CONCLUSION

Assessing an airline's overall competitive position is complex as airlines serve many different direct and indirect OD markets with varying degrees of competition. Hence, the "typical" HHI-based competition assessments will not always reflect the whole picture.

This extended abstract presents a modelling approach which aims at closing this gap. It allows for an assessment of the competitive position of airlines at the network level, considering the actual competitive positions on each single OD pair in relation to competing airlines, which are weighted by the relative importance of each city-pair in terms of OD passengers in relation to the airline's total passenger number.

An application of the indicator to the North Atlantic air transport market indicates sometimes volatile, but overall decreasing CPs in the long run. Reasons for this might include a relatively "narrow" market in the Noughties followed by overall capacity increases and the inauguration of low cost long haul services in the context of low fuel prices and an overall good economic climate in recent years. The results do also indicate higher CPs for specialized carriers, like e.g. leisure airlines that focus on direct flights to more "obscure" destinations, or airlines like Air Canada or SAS that serve many remote regions, than for the big players that offer quite similar multi-hub networks within their alliances.

Our approach could be a basis for an instrument that may be useful e.g. for policymakers or regulators. For example, in forthcoming cartel cases, it could be worth comparing an airline's present CP with the simulated CP after the merger.

There are a number of limitations to this approach. First, only the competition intensity on the same city pairs has been considered, neglecting any competition from similar routes operated from and/or to alternative airports beyond the same metropolitan regions, which may e.g. be reached by high-speed trains or car. Also, the CP could be calculated based on revenues instead of passengers, which might better reflect the carriers' financial perspectives. More importantly, as many airlines are not financially or strategically independent from each other and hence should not be regarded as competitors, the methodology should be performed for an amended dataset containing OD flows at the airline group and/or joint venture levels, to account for takeovers and cartels. Lastly, the relevance of the indicator could be further assessed in exploring to what extent it has an actual impact on airline financial figures.

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