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Airline and high-speed rail competition in Europe: towards a comeback of air transport?

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ERSA 50th conference

ERSA-NECTAR special session on high-speed rail as a new transport network

Airline and high-speed rail competition in Europe:

Towards a comeback of air transport?

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Abstract

The spectacular growth in air transport increasingly poses the question of its impact on the environment. It is for this reason that public authorities and researchers are counting on high-speed trains (HST), whose efficiency is said to make possible a modal shift to the detriment of the airplane. However, most studies of transport focus on the evolution of demand (passengers) rather than of supply, whereas it is basically the latter that determines environmental damage. In light of this fact, this paper has a twofold aim: on the one hand to compare the overall dynamics in the supply of air transport in Europe as compared to the HST supply, and on the other hand, to examine empirically a few city-pairs, focusing on changes in the supply of air transport under the pressure of competition from HSTs. In the process, we will show that the development of high-speed rail remains limited when compared to the impressive expansion in the supply of air transport. We show, as well, that for a given city-pair, the actual decline in number of flights depends on various conditions, including length of the HST journey and the strategies adopted by the airlines. Some carriers reduce their offer in terms of number of seats but increase the number of flights in order to compete more effectively with the HSTs. Finally, there remains the open question of the increasing strength of low-cost airlines in the face of competition from HST.

1. Introduction

The ongoing process of European integration and the democratisation of air travel have contributed to a radical transformation of long-distance flows on the European continent. As far as passengers are concerned, a growing proportion of that travel is done by plane (EEA, 2010). The liberalisation of European air transport has, notably, brought about a spectacular geographical diversification in supply (many more city-pairs are served) and has favoured its democratisation, spurred on in particular by the development of the low-cost supply (Dobruszkes, 2008). However, it is generally recognised that of all modes of transport, air travel is the one that in relative terms contributes the most to global warming (i.e. CO₂ eq. per km-passenger). While the absolute contribution of air transport to climate change remains low, we must remember 1° the uncertainties weighing on its real impact, apparently underestimated (IPPC, 2007; Lee, 2004), 2° the absence in foreseeable technological revolutions in the short and medium terms as regards fuel and, therefore, emissions, and 3° the potential for growth, which remains substantial (Peeters and Dubois, 2009). We must remember, moreover, the impact on atmospheric pollution, noise and public safety when it comes to areas located near airports.

As a result, the European Union and several countries have opted to revitalise their railways and develop new high-speed lines (HSL) for high-speed trains (HST), in the hope that mode substitution — from air to rail — will make it possible to meet demand for long-distance travel at a lower environmental cost (see e.g. CEC, 2001). They base this on two types of scientific analyses in particular: on the one hand, those that have shown the environmental benefit of such substitution (see e.g. Gand, 1987; Givoni, 2007 and 2009; Patterson and Perl, 1999). On the other hand, those that observed or predicted that HSTs were in fact able to compete with air transport. However, as we shall see in section 2, this raises several problems. Our aim here is to verify empirically the extent to which HST really make it possible to reduce air supply. More specifically, we wish:

1. In general terms, to measure the dynamics of airline services against the growth and spatial expansion of European HST services.
2. On a selection of city-pairs served by HSTs, to analyse if/how much the volume of air service has decreased under competition from HST, by measuring the number of seats and the number of flights instead of the number of passengers (i.e. the demand), as is usually done.

It should be emphasised that in adopting an environmentalist perspective, we are focusing on the supply of air travel and not on passengers.

The rest of this paper is structured as follows. Section 2 offers a synthesis of the existing literature on competition between transport by rail and by air. Section 3 presents the data and methods used to answer our questions. Section 4 seeks to compare global dynamics for the two modes of transport under consideration. Section 5 conducts an empirical analysis of the evolution of air transport supply for a sample of city-pairs. Section 6 presents conclusions for the future.

2. Air/rail competition: a short review

It should be noted, first of all, that now at last there is some literature available both on high-speed rail (HSR) service and on its interaction with other modes of transport. If one sets aside the literature on technical questions relating to high speed¹ travel, the scarcity of scholarly publications on this subject to date may be surprising, when compared to the substantial and varied literature on air transport². What is more, most of the literature on HSR was published in national journals (French ones, for the most part) that are more or less unknown outside their own country and in any case are not available in English. They are thus doubly inaccessible to a wider readership.

Concerning the interaction between air transport and other modes, research focused initially on competition between the different modes, and more recently also on their complementarity. The competition (subject of this paper) is examined either *ex ante* (forecast competition) or *ex post* (observed competition).

Forecast competition corresponds to the implementation, by researchers or consultants, of models to predict the modal split among modes (see e.g. Adler et al., 2010; Bel, 1997; COST318, 1996; González-Savignat, 2004; Román et al., 2007; for a comparison of older research, see Wardman et al., 2002: 55). Total journey time (including access time, waiting time and travel time), frequency and fares constitute the common variables in this research. In certain cases, the transport supply is more detailed (for instance, by including factors such as lateness, comfort, etc.) and the socio-economic characteristics of passengers (including trip motives) are taken into consideration (see e.g. Mandel et al., 1997). Traditionally, simulations

¹ Dealing with wheel-rail interactions, track geometry, rail corrugation, etc.

² Which, moreover, has a dedicated periodical, the Journal of Air Transport Management.

are made of improvements to the railway system (new high-speed trains) when compared to other modes of travel, or airplanes alone, leaving aside the question of night trains. Bel (1997) is distinguished, however, by analysing the impact of changes in road travel time on the demand for rail, whereas Hsu et al. (2010) analyse competition between HSTs and conventional trains.

Observed competition does not appear to have been subjected to systematic or exhaustive study. According to Kroes (2000), quoted by Wardman et al. (2002), this is due to the confidentiality of the data on account of business competition and to the fact that banks and governments primarily need *ex ante* studies to guide their investment decisions. In most cases, the published figures concern only one or another geographical market segment (see e.g. the review made by Wardman et al. (2002)). It must also be noted that for the most part, these figures are the result of generalist studies on HSR and not from research having specifically to do with intermodal competition (see e.g. Bonnafeous, 1987; Campos and de Rus, 2009; de Rus and Nash, 2007; Vickerman, 1997; etc.). Quite logically, we see that HSTs' market share falls as travel time increases in comparison with other modes. The latter factor is the major variable that explains the attractiveness of HSTs. Moreover, some studies qualify their results according to the fares being charged. Thus, Steer Davies Gleave (2006) shows that competition between HSR and air transport is less straightforward where low-cost airline (LCAs) are present on the market.

As interesting and useful as they may be, these observations nevertheless raise three problems. First, they often are content to analyse the evolution of demand (number of air passengers), leaving aside developments in the supply of air services, and more particularly in the number of flights. Yet these are the modalities of air supply (frequency, types of planes, distances, etc.) that shape its environmental impact and its potential reduction. Patterson and Perl (1999) are among the few who have studied the evolution of air transport supply (based on a few French routes served by HSTs during the 1980s). They did not find a marked decrease in the number of flights other than for the Paris-Lyons route, the only one that was then served by an HST route of maximum two hours.

Secondly, they are now often outdated and do not take into account the impact of the more recent liberalisation of air transport in Europe. Implemented progressively between 1987 and 1997, but mainly since 1993, liberalisation modified the rules of the game in favour of granting a quasi-total liberty to the airlines (O'Reilly and Stone Sweet, 1998). This policy has

led to a quantitative and geographical development in supply and to its democratisation, in particular on account of the boom in low-cost airlines (LCAs) (Dobruszkes, 2006 and 2008). Yet the latter are potentially changing the terms of competition between HSTs and air services.

Thirdly, they often limit themselves to analysing evolution in terms of city-pairs serviced by HSTs, and hence do not cover overall trends in flows. Yet, as the statistics on cross-channel travel illustrate, the decline in air travel due to competition from the Eurostar between Paris and London is rather negligible in relation to the strong growth in air traffic across regional markets where there is no competition from HSTs (DGAC-DAST, 2008) (Figure 1).

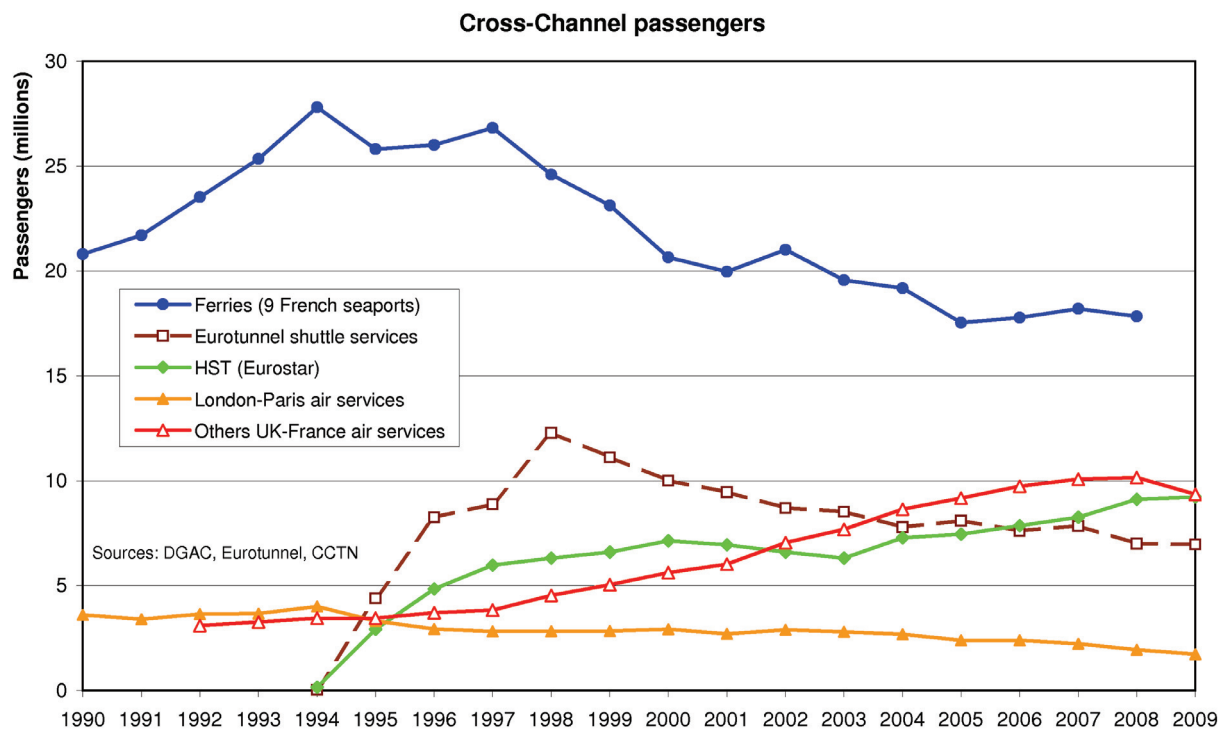


Figure 1. Evolution of cross-channel passenger flows

In other words, to verify the extent to which HSTs are really able to reduce the environmental impact of air transport, two approaches are needed that contrast with the majority of existing studies. First, focus should be on the analysis of the dynamics of the air supply *offer* rather than on demand. Secondly, the dynamics of air transport as a whole should be analysed, in addition to examining those routes that are served by HSTs. This is the approach we shall take here.

3. Data and methods

Our research looks at the European continent, within the boundaries of the liberalised air space (EU 27, Switzerland, Norway and Iceland), which covers *de facto* the countries that have HSTs.

Our analysis unfolds in two stages. First, we will present the overall dynamics of the development of air services in Europe, seeking to compare it with the dynamics of rail travel, drawing on aggregated figures and maps. Secondly, we will focus on a sample of a few routes where there is competition from HST and examine the evolution of air supply. The latter will be studied both in terms of numbers of seats and numbers of flights. The number of seats indicates the size of the market (transport potential). The number of flights makes possible a cursory view of the impact on the environment³. We have selected contrasting situations that attest to the diversity of the patterns of development, bearing in mind the principal variable of the attractiveness of the railway option: the journey time.

Figures for the regularly scheduled airline offer are available for the 1991-2010 period thanks to the data gathered by the OAG firm. The latter describes the planned world air supply in an exhaustive and disaggregated way. For each route the airlines, frequency, number of seats, among others, are available. These data makes it possible to distinguish the different airlines and thus to analyse the strategies they adopt. It also helps to highlight the low-cost offer, by following the list drawn up by Dobruszkes (2009).

The railway supply is, for its part, known thanks to the timetables published by Thomas Cook (European Rail Timetable). These make it possible to identify the existing links and travel times. Following the usage of the International Union of Railways (UIC), we consider city-pairs for which at least one part of the rail journey takes place on dedicated tracks that allow for a minimum speed of 250 km/h and thus qualify as high-speed lines.

4. Railway and air travel: comparing two dynamics

The geographical and quantitative comparison of railway and air travel supply is a delicate matter, since the way the two modes of transport operate is different. At a European level, air service consists essentially of direct flights linking city A with city B without stopovers.

³ To do so effectively, it would be important to take into account the type of plane. However, as the purpose of this paper is not to calculate environmental impacts, this does not present a problem.

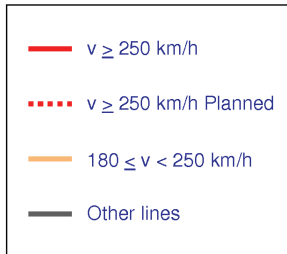
Conversely, most rail travel serves a series of cities (A-B-C-D), which makes calculating figures for city-pairs linked by HST difficult and does not assign the same significance to variables such as train-km or seat-km. In other words, the distances covered by train are spatially more efficient and therefore make it possible to link more cities than the same distance covered by plane.

Moreover, comparison of the development of supply and of demand for these two modes of transport is rendered difficult because the UIC makes freely available only statistics relating to the last known year (at present, 2008). The figures on earlier years are reserved to its members. What is more, save for exceptions, the data available from Eurostat do not make it possible to separate high-speed rail services from conventional ones, apart from the fact that it is not always possible to go very far back in time (or else only to the detriment of the number of countries available). This having been said, what limited data are available, along with personal calculations, make it possible to draw up a comparative sketch.

As far as infrastructure and supply are concerned, according to UIC, Europe in early 2010 had 6109 km of high-speed lines. These are concentrated mainly in France, Spain, Germany and Italy (Figure 2). It is important to remember that it took more than three decades to create this network, which covers Europe only very partially, even though very big cities are served (London, Paris, Madrid, Milan, etc.). In addition, around 3000 kilometres of lines are under construction and thousands of others are planned for the longer term.

European HS Network

Situation as at 06.2009



Information given by the Railways

UIC - High-Speed
Updated 14.03.2009
OG/IB



Figure 2. The European high-speed lines (2009). Source: UIC.

The Antwerp-Amsterdam, Bologna-Florence and Milan-Novara HSTs have been introduced more recently.

Certainly, service by HST is not limited to these HSLs. High-speed trains are generally designed to be able to travel along conventional lines as well. This means, therefore, that there are many more city-pairs linked by HST than figure 2 would suggest. However, when not using HSLs the travel time increases significantly and competitiveness with air travel suffers. To take just one example, in 2010 the French HST ('TGV') serves 132 urban regions in France (minimum 10 000 inhabitants), which means 751 city-pairs are directly linked. However, only 264 city-pairs are served in less than three hours⁴.

By comparison, air transport has seen quite a spectacular geographical diversification in its supply. In 1991, there were 1809 European links. Twenty years later, there are 3262 (+80%). In 2010, the links that have been added since 1991 amount to 60% of the city-pairs connected

⁴ Own calculations based on the SNCF timetables.

by plane. However, these account for only 24% of the seats, since the new routes often have low traffic density (small planes and/or low frequency)⁵. Even by limiting oneself to routes that are operated at least once a day, the development of the air network has been quite extraordinary (Figure 3). During the same period and in the same area, the number of flights has increased by 60%. If we correlate this dynamic to distance, growth has been 22% for flights of maximum 750 km and by 235% for longer flights⁶. In other words, European air transport is developing considerably within a market segment where there are either no HSTs at all or those that exist fail to be competitive in relation to planes.

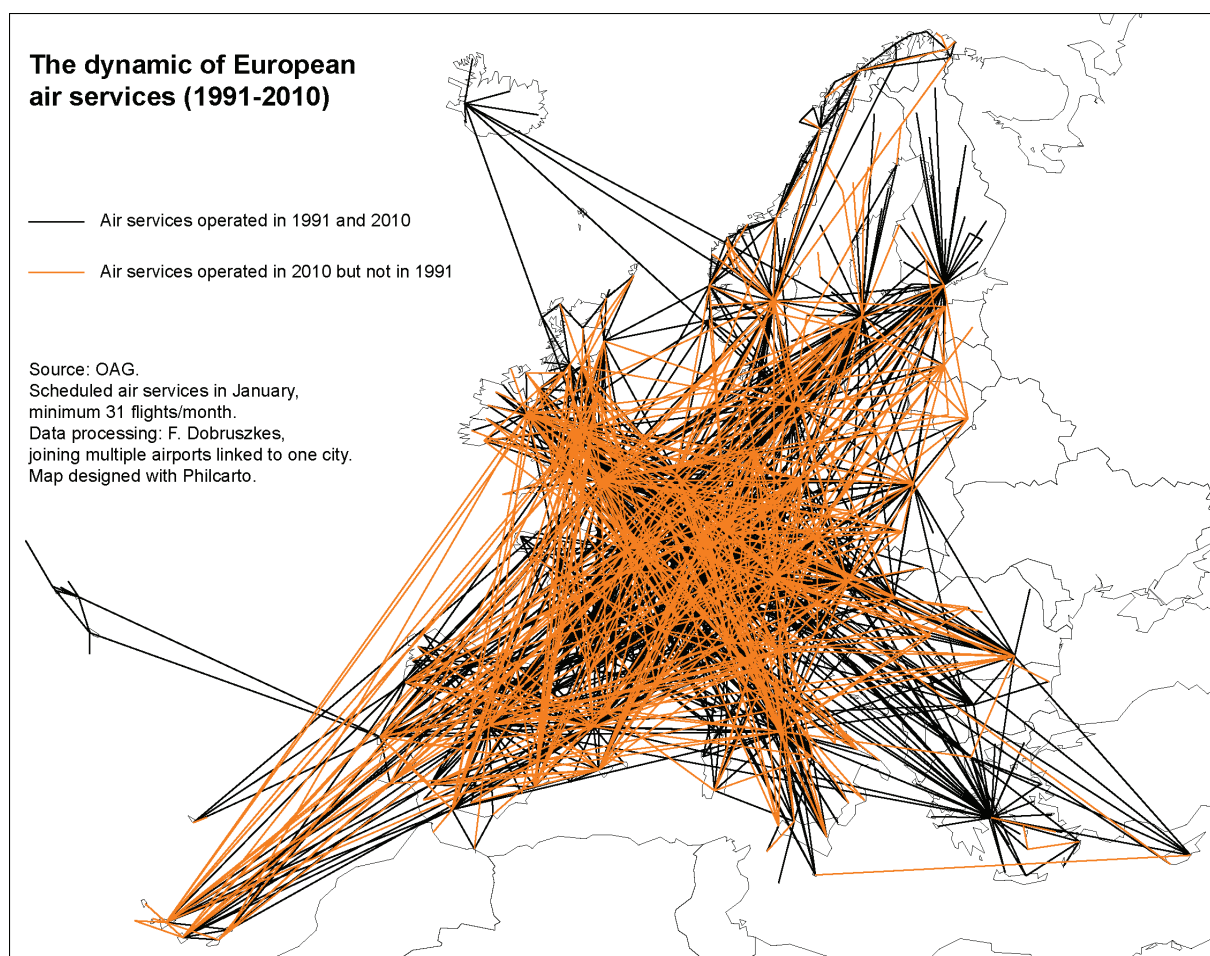


Figure 3. Long-standing and new air routes

⁵ Own calculations based on OAG.

⁶ Own calculations based on OAG.

Finally, from the point of view of demand, European statistics show a much stronger growth in air travel flows according to the number of km-passengers (figure 4).

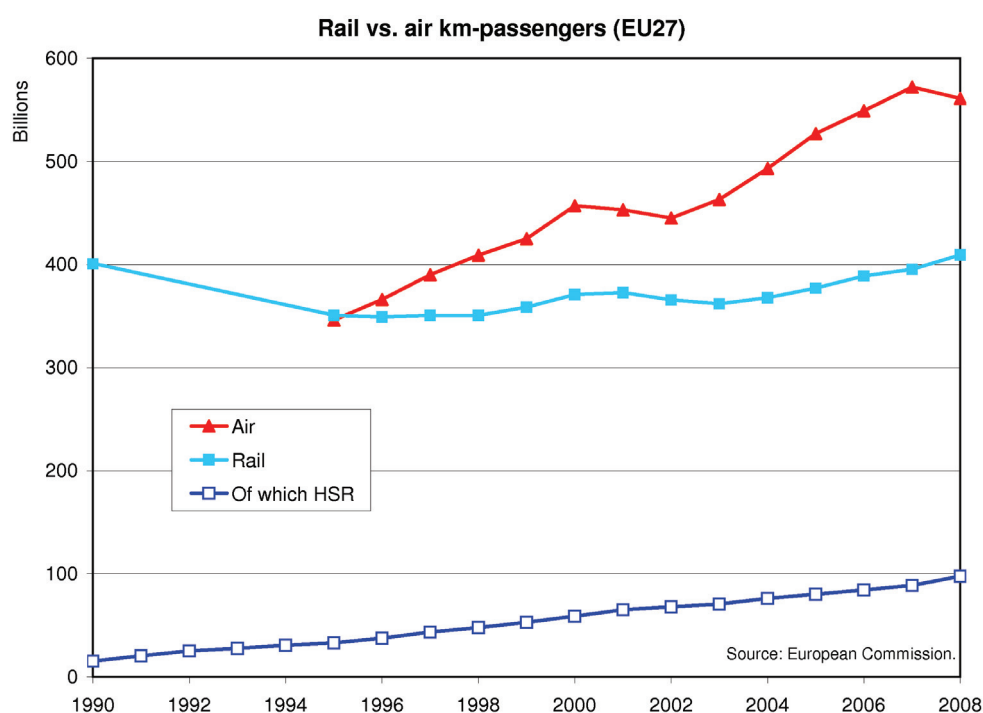


Figure 4. Rail vs air km-passengers

5. The impact of the HST on supply of air services

Moving now to the more specific dynamics along certain routes, five city-pairs have been chosen. These represent a variety of situations from the point of view of the major characteristics of the supply (travel time, frequency and fares) (Table 1). These case studies do not represent the existing situations in an exhaustive manner. They must be regarded, however, as a first stage that offers a good overview of the diversity in developments within air supply under competition from HSTs.

City-pair	Travel time (a)		Frequency (b)		Return fare (c)			Return fare (d)		
	HSR	Air	HSR	Air	HSR	Air (trad.)	Air (low-cost)	HSR	Air (trad.)	Air (low-cost)
Paris - Metz	83	60**	10	4**	107 €	NC	NC	34 €	NC	NC
Paris - Brussels*	80	60	34	1	117 €	334 €	NC	50 €	334 €	NC
Brussels - London	101	60	9	15	170 €	206 €	NC	88 €	152 €	NC
Paris - Marseilles*	182	75	31	14	165 €	245 €	122 €	47 €	189 €	103 €
Cologne - Munich	260	60	22	14	258 €	196 €	161 €	58 €	99 €	101 €

* Including trains serving the peripheral, Parisian HST stations (CDG Airport, Marne-la-Vallée or Massy).

** In 2005.

(a) Best travel time in minutes, excluding access to station/airport, check-in time and boarding time

(b) One way. Services to/from the Parisian outlying stations included.

(c) Purchased one week before the departure. One suitcase and all tax or extras included.

(d) Purchased three months before the departure. One suitcase and all tax or extras included.

NC: Not concerned

Sources: SNCF, DB, OAG, Amadeus.net and own calculations.

Table 1. HSR and air services for the five city-pairs analysed (weekday, 2010)

Case 1: The introduction of HST services leads to a complete discontinuation of air services (Paris-Metz/Nancy)

Between Paris and the airport shared by the cities of Metz and Nancy, air service was operated first by the regional airline TAT and then by Air Liberté, which took over the latter carrier in 1996. Air Liberté became Air Lib by merging with the airline AOM. As a result of financial difficulties, however, frequencies were reduced (Figure 5), making it easier for the flag carrier Air France to enter that market. Air Lib went bankrupt in 2003, but Air France did not take advantage of this to increase its frequency. On the contrary, it eliminated flights when the ‘TGV Est’ (Eastern HST) began operations, which reduced travel time from Paris to Metz and Nancy to 1h23 and 1h30 respectively and provided attractive frequency (10 trains per day in each direction).

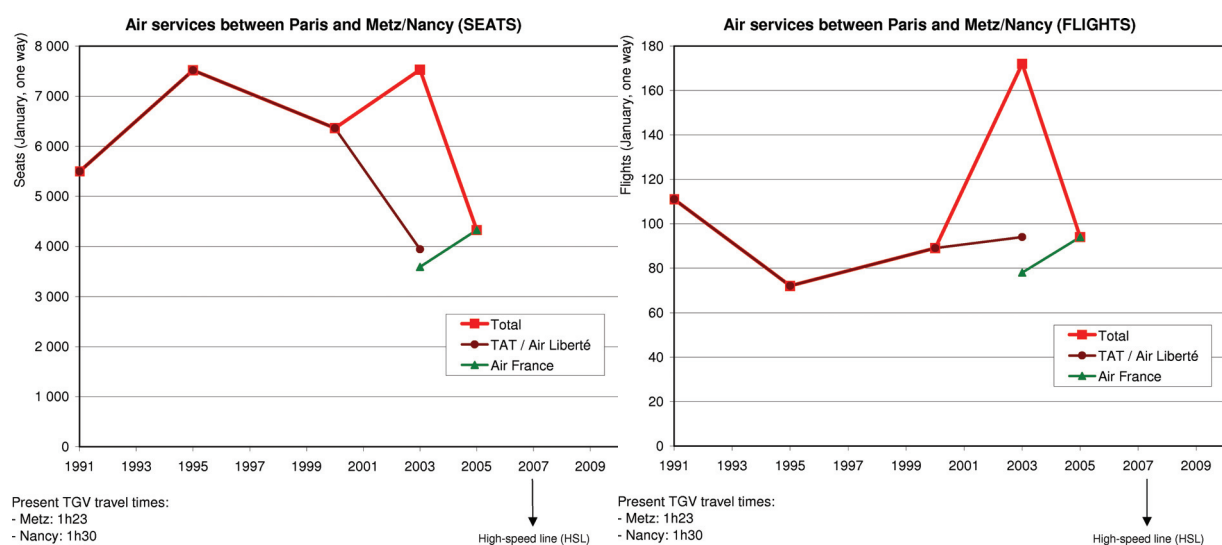


Figure 5. Evolution of air service between Paris and Metz/Nancy.

Case 2: The introduction of HST services leads to an almost complete discontinuation of air services (Paris-Brussels)

The introduction of the ‘Thalys’ HST service between Paris and Brussels reveals airline strategies of a slightly different nature. To face up to this new, effective rival (1h25, with a train every hour and in each direction between city centres beginning in 1998⁷), Air France chose to reduce its supply and then eliminate it altogether in favour of an agreement with Thalys under which passengers will have one or two carriages reserved for service between Brussels and the airline’s international hub at the Paris CDG airport (Dobruszkes, 2001). Conversely, the Belgian flag carrier, Sabena, opted to increase its frequency in order to try to counter HSTs (Figure 6). More generally, Sabena was pursuing a disproportionate growth strategy under pressure from Swissair, a policy that would ultimately lead it to bankruptcy (Allé, 2004). Its successor, SN Brussels Airlines — which later became Brussels Airlines when it merged with Virgin Express — limited itself to one flight per day intended to serve passengers feeding into its flights to sub-Saharan Africa⁸. Meanwhile, Thalys continued to increase its service with a train every 30 minutes for a large part of the day during the week, and a reduced travel time of 1 hour and 20 minutes (from city centre to city centre).

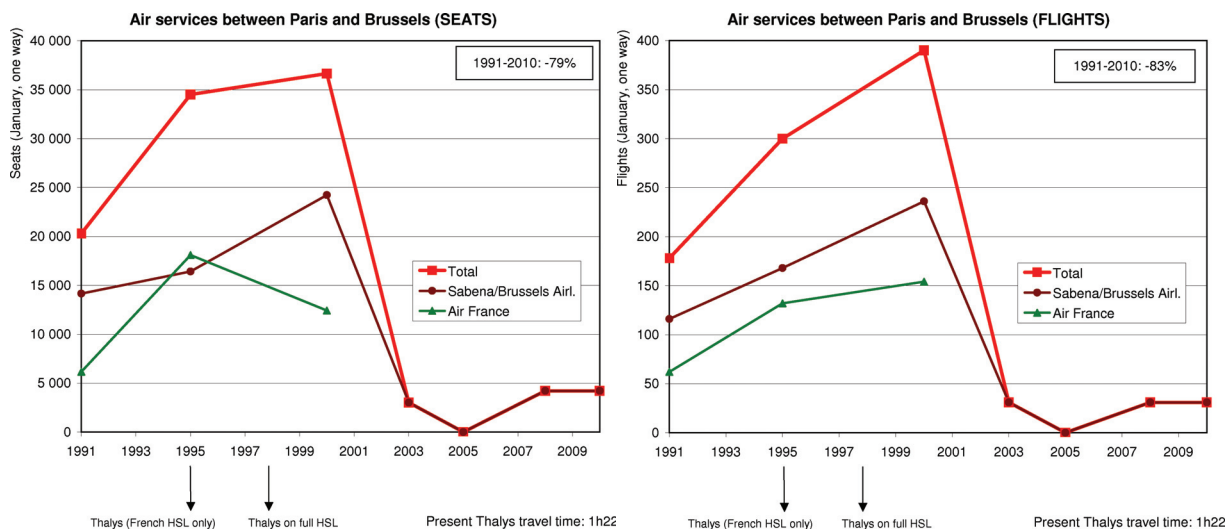


Figure 6. Evolution of air service between Paris and Brussels.

⁷ To these would be added the trains between Brussels and the French countryside via stations on the periphery of Paris, as well as the Thalys from Brussels – Paris CDG airport – Marne-la-Vallée (Paris Disneyland). The latter have recently been suspended in order to renovate the trains.

⁸ The short-lived elimination of this flight represented an attempt to serve the Brussels airport by a daily HST from Paris, but with an unattractive journey time that in part explains the failure of the experiment.

Case 3: The introduction of HST services leads to a major decline in air services (Brussels-London)

The case of Eurostar HST between Brussels and London is an example of a notable decline in air services between these two cities, albeit one that was not as spectacular as in the two previous examples (Figure 7). Moreover, part of that decline seems to be linked to the bankruptcy of Sabena referred to above.

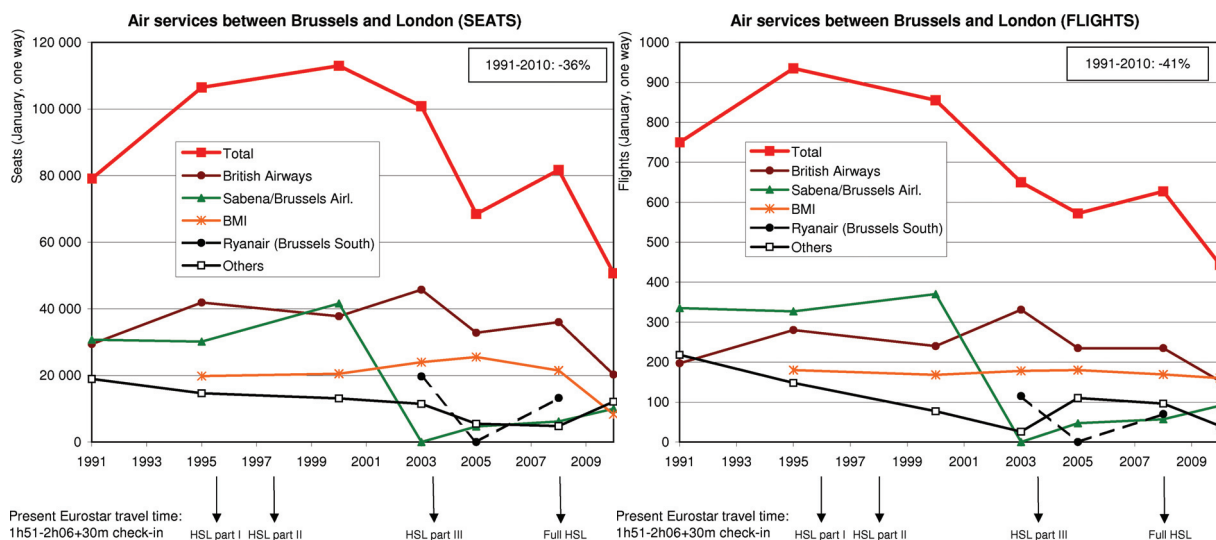


Figure 7. Evolution of air service between Brussels and London.

Several hypotheses may be advanced to explain this situation. First, the travel time by train is less favourable than in the previous examples, and to it must be added the check-in time (30 minutes)⁹. Secondly, Eurostar service is expensive (lowest price is EUR 88 return, as compared to EUR 50 for the Thalys from Paris to Brussels). Thirdly, London is the city with the best air connections in the world¹⁰. For this reason, its airports, and in particular Heathrow, draws many passengers to/from the rest of Europe who come for a connecting flight. Since the Eurostar does not serve any airport, it is often easier and cheaper to opt for an itinerary that involves two flights rather than a multi-modal journey (train + plane), in order to avoid lengthy and expensive transfers between railway stations and the airport in London. Finally, we must take into account the geographical features of the cities being connected, and in particular the spatial distribution of economic activities and populations that generate

⁹ Security on the Eurostar system is similar to that for air travel.

¹⁰ Personal calculations based on OAG.

international flows. In so doing, we can see that in London certain activities are located near the M4 corridor — sometimes referred to as the ‘English Silicon Valley’ — which is much closer to Heathrow airport than to St. Pancras Station in central London. In Brussels, the suburbs near the airport are home to a comfortable and highly qualified population, who find travel to the airport easier than to the HST station located near the inner city. In other words, not everyone travels from city centre to city centre, and so not everyone necessarily prefers the train, all other things being equal.

One should also bear in mind the attempt by the low-cost carrier Ryanair to supplement or compete with railway service by its flights from the Charleroi airport (‘Brussels South’). This airline has, however, eliminated that service since the opening up of the final stretch of HSL in England.

Case 4: The introduction of HST services leads to a decline in air services that is more significant in terms of number of seats than of number of flights (Paris-Marseilles)

Before the completion of the HSL between Paris and Marseilles in 2001, air services increased despite the launch of the Lyons-Valence HSL in 1994, supplementing that of Paris-Lyons which had been introduced in 1981/1983. The increase was substantial in terms of numbers of seats, but really spectacular as regards the number of flights (Figure 8). Air France, which operated the majority of the flights, developed a system of domestic high-frequency services — ‘La Navette’ [the Shuttle] — which permitted it both to offer flights every 60 or even every 30 minutes — an important commercial advantage for business travellers — and to occupy a maximum number of slots at the Paris Orly airport in order to limit competition¹¹.

The introduction of the Valence-Marseilles HSL in 2001 certainly led to a fall in supply in terms of seats and of flights as compared to what was available up until 2001. However, the decline in supply was not spectacular. The travel time by HST was a minimum of 3 hours, the ‘fatal’ threshold below which the train’s market share as compared to that of planes tends to be below 50% (Steer Davies Gleave, 2006; López-Pita and Robusté, 2005). Most importantly, however, even though Air France reduced its frequency, the total number of flights remained

¹¹ In fact, the airport is saturated, given the number of flights authorised by environmental regulations (200,000 movements per year).

22% higher than it was in 1991. The results seem therefore to be strongly influenced by the reference year being used.

Finally, we should note the effect of the appearance of Ryanair on the air-rail relationship (although operating from 'Paris' Beauvais, situated 80 km north of Paris). Among the various routes operated by Ryanair or EasyJet in France, Paris-Beauvais is the only one that tries to elbow into the market of HSR links of around 3 hours. Only time will tell whether this service, which at present is fairly marginal, will eventually increase.

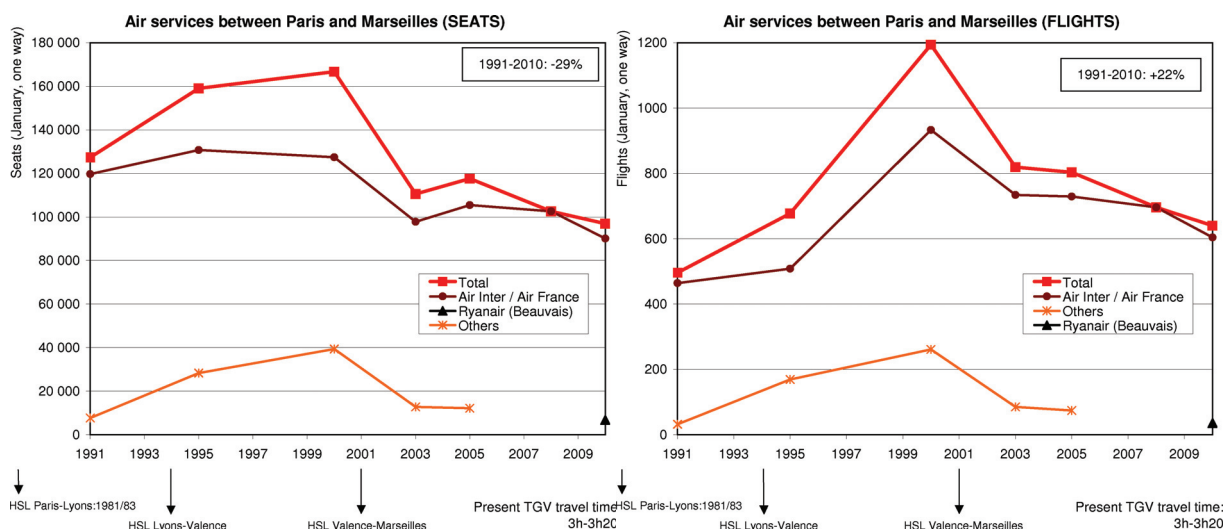


Figure 8. Evolution of air service between Paris and Marseilles.

Case 5: The introduction of HST services has not prevented an increase in air services (Cologne-Munich).

Between Cologne and Munich, the travel time by ICE train is between 4h20 and 4h40, since the trains do not run on HSLs for the entire journey and make several stops in between, in light of the density of the western German urban network. With that kind of travel time, HSTs have not prevented an increase in air services (Figure 9). However, this increase is not due to the flag carrier, Lufthansa, whose service was gradually reduced after an initial attempt to increase it when the Cologne-Frankfurt HSL was introduced. The increase is in fact the result of the arrival of the low-cost (DBA and Germanwings) or middle-cost (Air Berlin¹², which bought DBA) airlines.

¹² Authors disagree as to whether or not Air Berlin is a pure low-cost airline.

The question remains, therefore, whether in the case of HST services above three hours in length, which continue to be numerous despite competition from air travel (Lille-Marseilles, Milan-Naples, Munich-Hamburg, etc.), low-cost airlines are any more capable than the regular airlines of competing with HSTs, or even of capturing some of their market share.

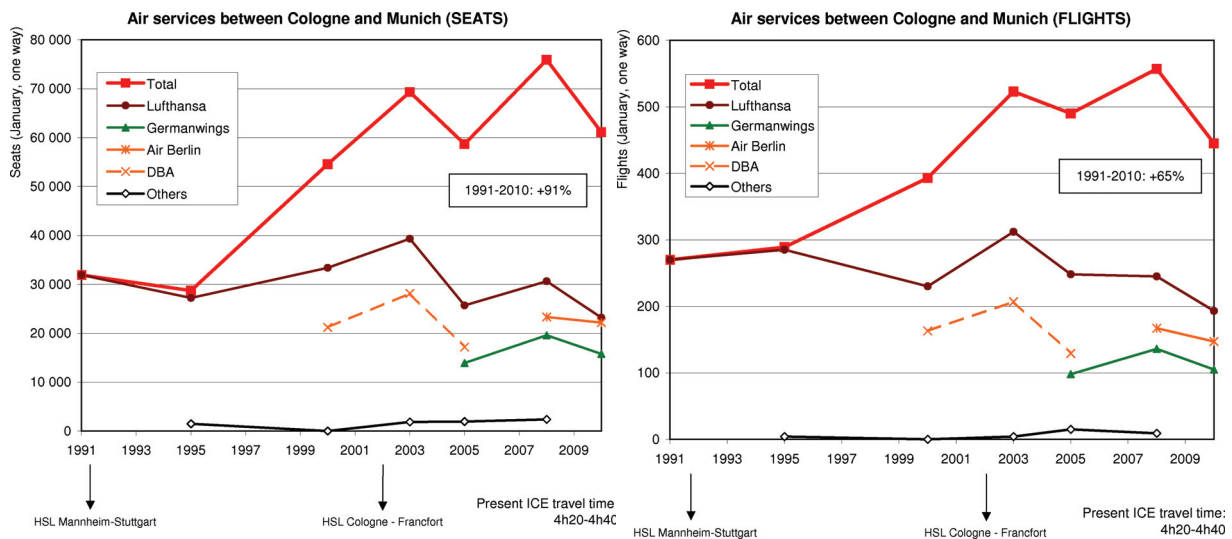


Figure 9. Evolution of air service between Cologne and Munich.

By way of conclusion, it appears that our results are fully in line with the existing literature. It does seem clear that the travel time by HST is an absolutely key variable when it comes to reducing air traffic, even though a number of additional variables also come into play (frequencies, fares, airport hubs, geographical structures of urban regions, etc.). However, we must emphasise the importance of taking into consideration the number of flights and not only the number of seats or of passengers. A decline in market share by air travel measured in terms of the number of passengers does not necessarily lead to a decline in air supply measured in terms of the number of flights. Finally, the year of reference has an impact on the results: analyses that do not go very far back in time can appear to overstate the decline in air service.

6. Forward-looking conclusions

These results constitute a first step that calls for fresh, exhaustive and multifactorial analysis of competition between HSR and air transport. What is needed for a successful study is to

analyse all city-pairs served by HST using a sufficient number of variables in terms of the characteristics of the supply and the demand of the cities being served.

Be that as it may, the existing data indicate that to date, the development of high-speed rail service in Europe, while significant, has not in any way prevented a strong overall growth in air traffic. In addition, the five city-pairs presented here qualify certain statements, sometimes naively optimistic, as to the ability of HSTs to compete with air travel, especially if one focuses on the number of flights rather than on the number of passengers and if one considers growth prior to the arrival of the HSTs.

Furthermore, future trends seem potentially contradictory. In one sense, future high-speed lines are being planned primarily in order to provide maximum service to the major European cities. A 50% increase in coverage by HSL in the medium term should therefore make it possible to expand significantly the area in which HSTs are competitive. But in another sense, several factors justify a certain degree of pessimism. First, the supply of air service has not stopped growing for distances for which HSTs are not very competitive in terms of travel time. Secondly, the continued democratisation of air transport and new competition between low-cost flights and HST raise the question as to whether the pendulum might swing back to the detriment of high-speed trains. Thirdly, we have shown that for routes that allow for the coexistence of both HSTs and air service, airlines may opt to increase their frequency, even if that means reducing the size of the planes used.

Finally, this study suggests two possible orientations for further research.

First, the competition between low-cost airlines and HSR should be re-examined a few years from now, since to date, it is difficult to say whether this competition remains on the margins or whether it is a trial balloon in view of a more major offensive. From this point of view, it must be borne in mind that competition is disloyal insofar as the modes of operation differ. In particular, it is well known that low-cost carriers severely exploit their staff and are often able to obtain significant reductions in airport charges or subsidies whose legality is disputable (Barbot, 2006; Dobruszkes, 2008; Hunter, 2006; Marty, 2004). By contrast, HSR services may be handicapped by high infrastructure costs linked to the cost of building HSLs (Sánchez-Borràs et al., 2010).

Secondly, in light of continuing urban sprawl and the (re)location of certain economic activities and populations to the periphery of major cities, the question arises whether the HST product, focused essentially on connecting city centres, will not face increasing difficulty. This in turn reopens the debate on land planning and on whether we will see a

return to the compact city or, conversely, an extension of HST service – even if only a partial one that is careful not to call into question the importance of city centres – to the suburbs and major agglomerations. Service to the Paris suburbs by three HST stations — clearly intended to provide a rail bypass that links HSLs among them while avoiding the Paris stations as final destinations — is a development in this direction that should not be underestimated.

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