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Title :

Strategic reactions of regional airports facing the competition of the high-speed train – Lessons from France

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Strategic reactions of regional airports facing the competition of the high-speed train – Lessons from France

Abstract :
The development of a high-speed train network in Europe has been one of the major threats affecting regional airports. While intermodal airports benefit from such an evolution, regional airports see their traffic being reduced considerably, mainly due to the diminution of feeding flights to the national hub. Facing such a challenge, regional airports can implement several strategies to maintain their growth. The first strategy relies on developing a transverse network allowing airlines to avoid any frontal competition with the train. The second one implies developing feeding flights with other hubs in order to reduce the dependence on the national airline. Some final remarks are given to help airport managers to apply soundly such strategies.

Principal management implications :

- The threat of the introduction of an high-speed line must be taken into account very seriously, because of its strong effect on the traffic of an airport.
- Regional airport managers can implement strategies to deal with such a threat.
- They must convince airlines to launch new transverse routes in order to avoid the competition with the train and maintain a certain level of profitability.
- In addition, airport managers can increase their traffic by feeding several hubs and reduce their dependence on the national carrier.
- However, these strategies need to be implemented carefully by taking into consideration the localization of the airport, the legal frame (state aids) and the possible sanctions of the national carrier.

Keywords :
Regional airport ; High-Speed Train ; Intermodality ; Transverse route ; Multi-hub competition.

Introduction

The rapid development of the high-speed train (HST) in Europe has not only revolutionized the rail industry, but it also has had a significant impact on air transport. Very often presented as an opportunity for major airports, air-rail intermodality can also be seen as a threat for regional airports which see a major part of their traffic diverted towards the HST. Confronted to such a threat, regional airports have to implement new strategies that must be studied in depth.

Over the last twenty years, the high-speed train (HST) network in Europe has increased considerably, such that there were 6178kms of high-speed lines in 2009 as compared to only 1024kms in 1990 [1]. As a consequence, a fierce competition between airlines and rail operators appeared on some routes. This air-rail competition has been the object of an extensive literature [2 ; 3 ; 4 ; 5 ; 6 ; 7 ; 8 ; 9; 10]. In all these contributions, it appears that the introduction of the HST increases the rail market share, which is principally explained by the fares and the time spent in the train.

In parallel to these contributions, a growing part of the literature has highlighted the complementarity between air and rail transport [11 ; 12 ; 13 ; 14]. These authors underline the benefits that airlines, rail operators and airports can draw from the development of high-speed lines in Europe. This cooperative approach is very often called "air-rail intermodality". The intermodality can be defined as the "characteristic of a transport system, that allows at least two different modes to be used in an integrated manner in a door-to door transport chain" [15]. In this case, rail and air transport are used in an integrated manner, with a connection at an intermodal airport. Naturally, it has been stated that air-rail intermodality should not be seen as a threat for airports, but as an opportunity to be grasped. The underlying reasoning is that high-speed lines increase the catchment area of intermodal airports, allowing them to use optimally their slot capacities [16 ; 17 ; 18 ; 19]

However, the situation is much more contrasted than it is usually admitted. If air-rail intermodality presents very clear advantages for intermodal airports, it remains a threat for many regional airports. For these secondary airports, the introduction of the HST has been synonymous of a reduction of traffic, mainly due to the suppression of feeding flights towards the capital city. Since more and more regional airports are facing this threat, it is necessary to analyze how they can react. In other words, **facing a reduction of their traffic due to the development of an high-speed line, what set of strategies can be implemented by regional airports ?**

This article will be divided in three parts. In the first part, the uneven effects of air-rail intermodality for airports in Europe will highlighted. This part will be the occasion to understand the threat it represents on regional airports. In the second one, several strategies adopted by French regional airports that face such a threat will be described. In the last part, some conclusive remarks concerning the implementation of such strategies will be addressed.

1. The uneven effects of air-rail intermodality on airports in Europe

As it has been briefly explained in the introduction, the development of air-rail intermodality has affected very differently the various categories of airports. While some airports have clearly benefitted from the development of HSL, other have seen their traffic diminish strongly.

1.1. A strong positive effect on intermodal airports

The development of a high-speed line network in Europe has benefited from a strong political support. But far from being developed in parallel to other transport systems, it has been decided that the high-speed train should be implemented in order to be fully integrated to other transport modes. Several White Papers concerning transport [20 ; 21 ; 22] or European Studies [23] have all stressed out the importance of transforming airports in multimodal platforms. For instance, in the European Commission White Paper (2011), it is put forward that : "Better modal choices will result from greater integration of the modal networks: airports, ports, railway, metro and bus stations, should increasingly be linked and transformed into multimodal connection platforms for passengers."(p. 7).

For intermodal airports, such rail links can create two categories of benefits. The first category recalls from "market size benefits" due to the increased catchment area. Since major European hubs (such as Paris, London, Frankfurt, Amsterdam,…) are competing to attract as many airlines and connecting passengers as possible, the size of their catchment area is an essential element for the competition. The bigger the size of the catchment area, the more passengers may decide to use this airport for their trips. As a consequence, airports want to use the HST as a way to attract more connecting passengers, even if this "race to the largest catchment area", may lead to confrontation due to catchment area overlap [24].

In parallel, the connection of airports to the rail network has contributed to an optimization of slot allocations. Over the last decades, the hub-and-spoke configuration of airline networks has led to a polarization of the traffic around some major airports, that are now heavily congested [25]. The substitution of short-haul flights by HST services can free several slots and reduce congestion at these hubs. However, it is very unlikely to see these slots

remain unused. Consequently, they will probably be used for bigger planes, allowing airports to host more passengers and collect more taxes (with passenger taxes for instance) without having to create new terminals.

If the situation seems highly positive for intermodal airports, the consequences of air-rail intermodality are much more contrasted for regional airports.

1.2. A serious threat for many regional airports

It is hard to clearly define "regional airports", and one of the ways to do it is to define them in opposition to hub airports [26]. In other words, regional airports exist primarily to serve their local market (with a very local demand) and they lack of the international stature of major hubs. It is then very unlikely to see connections at regional airports, because they usually host point-to-point flights or feeder flights.

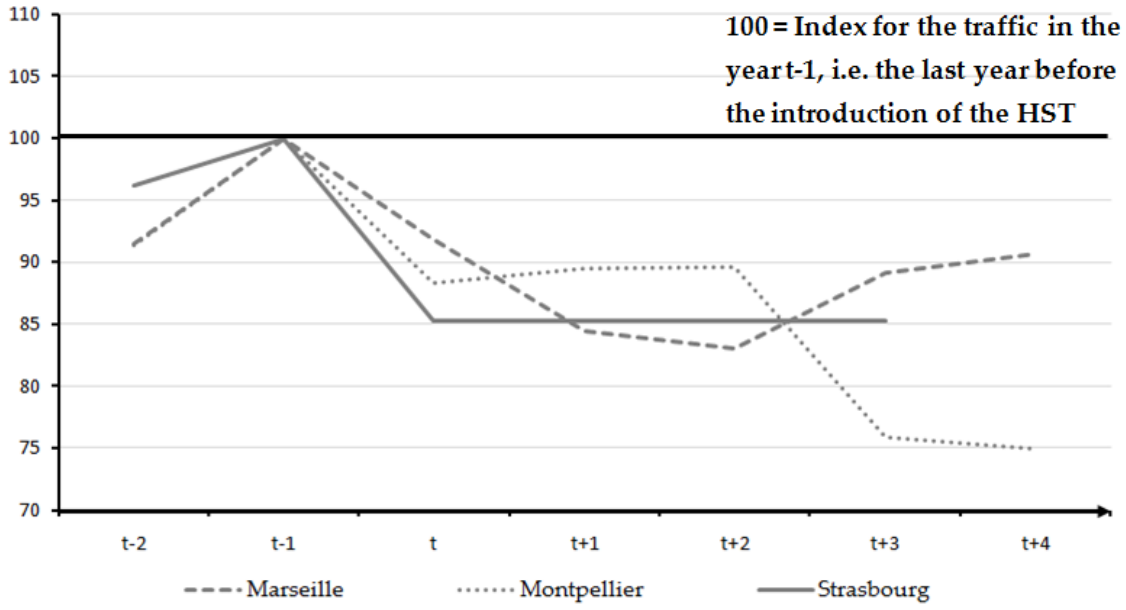
The development of the HST network in Europe has led to the connection of many regional cities to their respective capital city. However, because of the very high cost of these infrastructures, not all regional cities have been connected to the HST network at the moment. Consequently, regional airports are affected differently, according to the presence of the HST in their local market or not. Some airports, such as Nice or Toulouse, remain protected for now from the HST, while others have to face it directly.

Indeed, if there is undeniably a generation effect due to introduction of the HST [27], it also appears that many airline passengers have decided to switch to the train for distances below 800 km [28]. As a consequence, many legacy carriers have decided to cut their capacities between these regional airports and their hub, because feeding flights were not profitable anymore. One may see the effects of the HST on the number of passengers for several regional airports in France on Figure 1. In this figure, the traffic of several French regional airports before and after the introduction of the HST has been represented. One can easily see that in the years preceding the HST (i.e. *t-2* and *t-1*), the traffic keeps growing on these airports. But as the HST service is launched on this route (i.e. in *t*), the traffic shrinks significantly. In this case, the introduction of an HST service on a given route leads to a reduction of the number of passengers (by generally 15%), even if the airport was growing strongly in the previous years. This reduction of the traffic can be explained by the transfer mode, from plane to train, of many passengers on the route between the regional and the capital cities. This transfer comes in two main steps.

First, it is important to recall that point-to-point passengers usually pay a higher price than connecting ones on a feeder flight [29], and that they are obviously less sensitive to connecting issues. Consequently, the HST is a very good alternative for them, because it is

often less expensive and the total time travel is very close (and sometimes smaller) to the one with an airline. So, one could say that these point-to-point passengers are the most "HST-sensitive"

Figure 1. Impact of the HST on the passenger traffic of several French regional airports



t represents the first year of HST service on the route between Paris and this city.
In this case, t = 2001 for Marseille, Montpellier and t = 2007 for Strasbourg
Source [30 ; 31; 32]

In a second step, the national carrier that was serving this domestic route realizes that the absence of these point-to-point passengers impacts very negatively the profitability of this route. More precisely, the absence of these high-value passengers makes impossible the implementation of a cross-subsidy scheme among connecting and non-connecting passengers. As a consequence, the national carrier decides to cut its capacities on this route. A very limited service is maintained, but sometimes it may be stopped completely. In addition to this rationalization of capacities, one may even observe air-rail intermodal agreements signed between the national airline and the rail operator to feed their intermodal hub on this route. Such agreements exist between Air France and the SNCF (on Paris-Lille, Paris-Nantes, Paris-Brussels,…) or Lufthansa and the Deutsche Bahn (on Frankfurt-Cologne or Frankfurt-Stuttgart).

The consequences for regional airports are often dramatic, because the main airline of the airport decides unilaterally to cut a major part of its services and in a very short period of time. Facing such a reduction of the traffic, regional airports have to develop defensive strategies in order to survive.

2. Defensive strategies for regional airports facing HST competition

Airlines have the choice between several categories of network configuration. They can either develop a point-to-point network, or a hub-and-spoke one [33]. Low-cost carriers will generally adopt a point-to-point strategy, while legacy carriers will prefer a hub-and-spoke approach. However, one can also witness some fuzzy strategies in which an airline will have a dominant approach (the hub-and-spoke one for instance) and a marginal one in parallel (the point-to-point one). This simple distinction allows to distinguish several strategies that can be implemented by regional airports facing the competition of the HST.

2.1. Avoid frontal competition with the HST by implementing a transverse point-to-point network

As it has been explained earlier, airlines and rail operators are in competition for short-haul flights. However, when the rail trip lasts more than 3 or 4 hours, the advantage comes back to the plane. In addition, it is interesting to note that usually, the HST network has been implemented in order to link in priority regional cities to the capital city, and not regional cities among them. Consequently, train users wanting to travel between two regional cities must sometimes connect at the capital city, increasing considerably the total travel time. However, if this statement is particularly true for centralized countries such as France, one may want to moderate it for countries with a more balanced geographical structure such as Germany.

In order to avoid competition with the HST on radial routes (i.e. routes from a regional city to the capital one), airlines can have interest in implementing transverse routes (i.e. routes between two regional cities) that are not served directly by the HST at the present time. On these point-to-point flights, air passengers are more captive and have a lower price-sensitivity because they have no suitable alternative. As a matter of fact, it is precisely the strategy adopted by Air France in 2011 (the "*base province*" project) to counter low-cost carriers and the HST.

These routes can either be domestic or international, and served by either legacy or low-cost carriers. For instance, the introduction of the HST between Paris and Rennes (France) has led to a significant reduction of Air France's offer between these two cities. However, this threat has been seen as an opportunity to transform Air France's network from Rennes airport, fostering direct services to regional cities such as Marseille, Lyon, Toulouse or Nice. These transverse regional flights represent now more than 74% of domestic flights at Rennes airport. This transverse approach can be applied to short-haul international routes too. This strategy is often implemented by European low-cost carriers that focus on point-to-point

destinations. For instance, airlines such as Ryanair or Easyjet have opened direct routes between regional French cities and England.

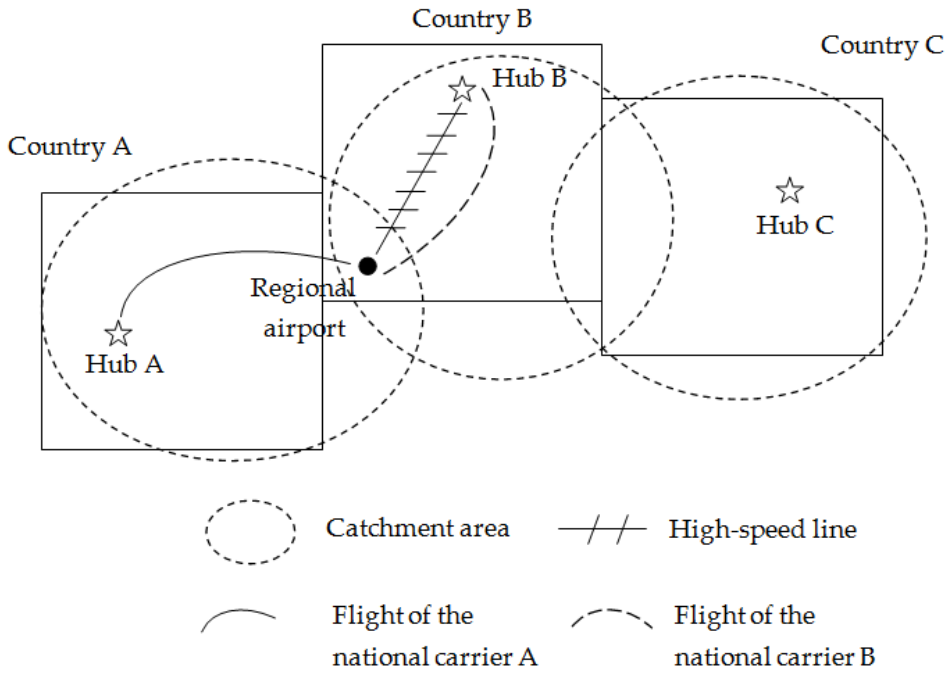
To do so, airports managers must convince airlines of the potential of such point-to-point routes. In this case, the size of the market will mainly depend on the local demand. Such routes might be opened because of the touristic potential of the region, because of demographic links between the two regions,… Nevertheless, it may be necessary to develop a set of incentives to attract airlines on such new routes. In a nutshell, the main idea remains to avoid, as much as possible, any direct confrontation with the HST, in order to secure a certain level of profitability for the airlines.

2.2. Take advantage of the competition between European hubs to create new feeder flights

The hub-and-spoke structure clearly separates feeding flights and hub-to-hub flights. With such a configuration, feeding flights bring passengers to the hub where they connect to another flight to their international destination. Consequently, the more feeding flights a hub has, the more it is attractive for airlines. European legacy airlines (such as Air France-KLM, British Airways, Lufthansa, Iberia,…) try to increase the catchment area of their respective hub, by developing several routes throughout Europe to feed it. As a result of this race, the catchment area of a typical European hub has been enlarged from the national country to the neighboring ones. Consequently, several regional cities could have the legitimacy to feed different hubs. For instance, the distance between a city like Montpellier (in the south of France) and Madrid is close to its distance to Paris.

In parallel, if a regional airport has seen its traffic reduced considerably because of the presence of the HST, it is mainly due to the cut in the feeding flights of the national carrier. Since the presence of the main national carrier has been reduced to a minimum (or even if it has decided to stop completely its services), then a regional airport can suggest to a foreign legacy carrier that its local region may have the potential to feed its hub.

Figure 2. Overlapping catchment areas and regional airports' strategies



In the Figure 2, the defensive strategy that can be adopted by a regional airport in the country B is detailed. Before the introduction of the HST, the regional airport was served by the national carrier B. With the beginning of HST services, the national carrier B decided to reduce considerably its capacities between these two cities, leaving the regional airport in a difficult situation. As it has been explained earlier, catchment areas of European hubs tend to overlap more and more, and some regional airports belong to several potential catchment areas. In this example, the regional airport could feed either the hub A or hub B. Since the national carrier B has decided to cut capacities, it makes sense for the regional airport to convince the national carrier A that it could feed its hub. By doing so, the regional airport maintains a high traffic while reducing its dependency to the carrier B. For instance, a regional airport such as Montpellier has seen its capacities on the route to Paris reduced by Air France because of the competition of the HST after 2001. In order to compensate the reduction of traffic, routes to Madrid have been inaugurated to feed Iberia's hub. This has not only reduced the dependency of this airport towards Air France, but it also allows passengers departing from Montpellier to have a broader choice to travel abroad, because they can travel through two different hubs. The same reasoning can be applied to Bordeaux airport which offers not only flights to Paris, but also to London in order to feed two hubs in parallel.

3. Discussion and conclusion

Since the high-speed train network should keep growing in the next decades, more and more regional airports will face the competition of the HST. If at first sight, the HST is a threat for

these local airports, it is important for them to transform this challenge in an opportunity to evolve. In this last part, the question of the scope of these previous recommendations must be addressed. Indeed, there are some practical and theoretical limitations in the implementation of such strategies.

From a practical point of view, as it has been explained earlier, both strategies (either developing a point-to-point network or feeding the hub of a foreign airline) allow regional airports to react efficiently to the competition of the HST. However, if these strategic responses to the HST have worked for several regional airports, airport managers must remain careful in using them. They must keep in mind three very important constraints.

The first constraint comes from the geographical position of the airport with respect to the different hubs. To belong to the catchment area of a hub, a regional airport generally has to be less than 1000-1500 km away from it. In European countries, this constraint is not very important because most regional airports are at the intersection of several catchment areas. However, some regional airports that are in remote regions (by opposition to central) of Europe, such as the south of Spain or the North of Sweden, may find difficult to convince another hub of the potential of their feeder flights.

The second constraint is a legal one and it affects both strategies implemented by airports. Over the last years, several European regions have tried to attract airlines and especially low-cost carriers because of their positive impact on the local economy. Many aids were given directly or indirectly to airlines in order to convince them to serve regional airports. Naturally, one may think that such incentives should be set in order to implement the strategies described earlier. However, airport managers have to be very careful with such aids. Indeed, after several complaints, the European Commission has published in 2005 its "Community guidelines on financing of airports and start-up aid to airlines departing from regional airports", in which the rules concerning such aids are explained very clearly.

The last constraint comes from the bargaining power between airlines and regional airports. Because of their relative small size, regional airports are very often dependent on one or two airlines that have a very high bargaining power. If the national carrier has decided to cut all its capacities departing from this regional airport (as it has been the case for airports like Nimes (FNI) in France), then cooperating with a foreign airline to feed its hub seems natural and not risky at all. However, if the national carrier has maintained a given level of service from this regional airport, then airport managers must be very careful in their search of foreign airlines. Indeed, cooperating with a foreign carrier to feed its hub, can be interpreted as a betrayal by the national carrier, which may take actions to punish the regional airport, such as reducing the number of flights or leaving the airport for a neighboring one. Consequently, such strategies must be implemented soundly by airport managers, who must

be sure that they have enough bargaining power with the national carrier to maintain its presence.

As a practical conclusion, airport managers must keep these three constraints in mind, in order to make the most of such defensive strategies.

From a theoretical point of view, one of the main limits of the approach developed earlier is to be airport-based or axis-based. In other words, the competition of the HST has been studied at the level of a given route and not at the level of the entire network of the airline. This route-based approach may lead to neglect some network effects that could affect strongly airlines' strategies. Taking into consideration these network effects, one could understand better why airlines keep serving or not a given airport, while facing the same level of competition of the HST. This sharper insight in airlines' strategies concerning their regional network could clearly improve the quality of the recommendations addressed to airport managers. As a consequence, a network-based approach should lead to future research since it could give a better understanding of the interactions between airlines, the HST and regional airports.

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