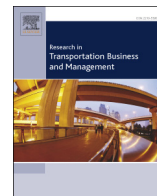




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Low cost carrier and high-speed rail: A macroeconomic comparison between Japan and Western Europe

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ABSTRACT

In this paper, we offer a macroeconomic comparison between the low-cost carrier (LCC) – high-speed rail (HSR) sectors in Japan and Western Europe (with a focus on France, Germany, Italy and Spain). We observe that the Japanese LCC sector seems to be lagging behind its European counterparts while both regions have strong HSR systems but the Japanese case appearing more dominant. A few factors may play a role in this contrast. First, a larger geographical coverage and the more polycentric urban system in Western Europe means that there are more viable markets for LCCs. Second, HSR predated LCC by a long period of time in Japan, while they emerged almost at the same time in Western Europe. This might give extra strategic advantage to HSR in Japan, since if HSR has established itself in a market, it is very hard for LCCs to compete; but if LCCs has a period of time to develop, they might have a chance to survive. Last and probably most importantly, both Japan and Europe have promoted HSR as the government key projects, but the European government has a more liberal attitude towards its aviation sector compared with the Japanese government.

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1. Introduction

Over the past decades, the commercial aviation industry has undergone significant changes. Among all the disruption factors, two might have important impacts: the low-cost carrier (LCC) business model within the industry and the high-speed rail (HSR) as a strong substitute and competitor. On the one hand, the advent and growth of LCC have revolutionized the way in which airlines do business. Formed as a result of liberalization, LCC has successfully implemented the idea of “cost minimization” and stripped the industry back to its essential. The LCC model was first introduced in the US and pioneered by Southwest Airlines in the early 1970s. Despite the success of Southwest Airlines in America, the spread of LCCs around the world was relatively slow. It was in the mid-1990s when this phenomenon was ultimately implemented in certain Europe and many other parts of the world. The advent of LCCs has beneficial impacts on passengers, airports’ traffic¹ and their financial performance, and tourism to a certain extent. For instance, the number of travelers at Charleroi airport increased from 20,000 in 1997 to 1.27 million in 2002 since Ryanair began to operate there in 1998, and only 2.3% (29,505) of the total 1.27 million travelers were non-

Ryanair travelers (Barrett, 2004). However, there is a little ex-post evidence to support that aviation liberalization has truly contributed to the growth of tourism business, and the positive impacts of LCCs on tourism are normally restricted to tourist destinations newly served by such airlines (Dobruszkes, Mondou, & Ghedira, 2016). On the other hand, with increased train speed, HSR has become a de facto substitute and effective competitor of air transport, especially for travel time within 2–2.5 h (Dobruszkes, Dehon, & Givoni, 2014) or up to 3 h (Fröidh, 2008). However, HSR services are no longer a good substitute for aircraft services when the travel time becomes longer. Therefore, travel time, which largely depends on the distance of routes and the speed of HSR, plays a critical role in the competition between HSR and LCC.

HSR has become a growing phenomenon all over the world. In countries like China, Japan, South Korea, France, Germany, Italy, Spain, and the United Kingdom, HSR is already a common transport mode for millions of passengers every day. Many countries including the United States, India, Malaysia, Thailand, Russia, and Brazil, are seriously considering their HSR development, and some of them even have had a clear schedule on the table. With this growing popularity, HSR has become one of the biggest threats for the airlines. Several examples support that airlines have been forced to leave or decrease short-haul routes.² For example, Givoni (2006) concludes that the entry of HSR results in a withdrawal of aircraft on routes of about 300 km (e.g., Paris-Bruxelles

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¹ The traffic unit in this paper refers to passengers only, since the passenger side of transport is the main focus of this paper.

² Short-haul routes generally refer to travel time up to 3 h or the market range less than 500 km.

and Nagoya-Tokyo). More recent cases include several Chinese domestic routes such as Wuhan-Nanjing, Nanjing-Shanghai, and Zhengzhou-Xi'an. Deep cuts of airfares after the entry of HSR service are also very common. For example, the market between Wuhan and Xiamen, two Chinese cities recently linked by HSR, saw an 80% drop in air ticket price (CAPA, 2013). Although the global aviation industry is still likely to continue to grow at a fast pace despite of the success of HSR on given routes, intermodal competition and the development patterns of airline networks may experience some major changes.

These two phenomena are particularly relevant for a few reasons. First, one of the main advantages of HSR compared with airlines is its much lower ticket price. This is true in most of the cases but may not hold in the markets where LCC exists (Casas Esplugas, Teixeira, Paulo, López-Pita, & Bachiller Saña, 2005).³ Second, HSR is a formidable competitor for the airlines only for short-haul markets (Milan, 1993; Rothengatter, 2011), while short-haul markets are basically the bread and butter for most LCCs.⁴ Overall, compared with traditional full-service carriers (FSC), it is fair to say that LCC is in a more fierce competition with HSR. More interestingly, the interactions between LCC and HSR show different patterns in different markets. For example, despite of being the continent of one of the world's most extensive HSR networks, Europe still has a very strong LCC sector which maintains a sufficiently high level of competitiveness in the face of HSR competition. In fact, the LCCs are so strong in Europe that the HSR operators start to copy its business model, creating "low-cost high-speed rails", with OUIGO in France as a notable example (Delaplace & Dobruszkes, 2015). Recently, another low-cost high-speed rail service "IZY" between Paris and Brussels, operated by Thalys, began operation on 3rd April 2016. One of the main differences between OUIGO and IZY is that IZY uses main stations (e.g., Brussels-South, the biggest rail station in Brussels) while OUIGO uses secondary stations (e.g., Marne-la-Vallée in Paris). Clewlow, Sussman, and Balakrishnan (2014) also find that European air traffic experienced a significant increase because of the expansion of LCCs while HSR substitution has led to a modest decrease in system-wide air travel demand. On the other hand, as the first country to develop HSR system, Japan's LCCs seems to be struggling for survival and further development. We have observed limited expansion of LCCs in Japan after the domestic liberalization in 1997. Skymark Airlines made a profit only in 2004, whereas both Air Do and Skynet Asia Airways operated at a loss (Murakami, 2011). Zhang, Hanaoka, Inamura, and Ishikura (2008) identify that highly regulated domestic market, scarcity of open-skies agreements, and lack of secondary airports are the main reasons why Asian LCCs lag behind European counterparts. Therefore, without a broader view of case comparisons, we probably won't be able to capture the full picture of this LCC-HSR relationship.

Understanding such, in this paper, we fill this gap by providing a case comparison for the development of LCC as well as HSR in both Japan and Western Europe via a comparative research analysis, which is widely used in social sciences. The essential objective of such method is to search for variances and similarities (Mills, Van de Bunt, & De Bruijn, 2006). The search for variances focuses on differences so as to have a better understanding of specificities. In this way, the comparison not only reveals differences among social entities but also discovers unique aspects of a particular entity that would be hard to detect otherwise. Those searching for similarities, on the other hand, pay more attention to universality or general processes across various contexts. Therefore, we can find the largest difference between Japan and Western Europe via such methodology. Several papers also applied this methodology to study different topics in the transport industry. For example, Oum

and Yu (1994) apply a comparative analysis to investigate the economic and financial performance of railways of 19 countries. Oum, Yu, and Fu (2003) compare the productivity performance of 50 main airports in North America, Asia Pacific, and Europe by applying a comparative analysis. It should be noted that this methodology has its limitation, as well documented by literature (e.g., Mills et al., 2006; Peterson, 2005). In particular, it is very hard to take into account the complex diversity among countries/regions under comparison. However, it can serve as a useful first step in presenting a particular problem. With this in mind, we do not attempt to reach definitive conclusions with this paper. Instead, the focus is to open up a particular research venue and point out a few possible directions for utilizing more sophisticated methodologies in the future. Some of the potential future research will be discussed in the concluding remarks.

Admittedly, the comparison between Japan and Western Europe may raise some concerns, as it is likely to be biased to compare a single country with a region. However, it should still be on solid ground given that the Single European Act has already united the whole European Union into a single aviation market, while the integration of the Trans-European high-speed rail network (TEN-R) has also been successful and ongoing. In fact, with respect to European LCCs, it is very hard to define their "home country", with big players like Ryanair and Wizz Air having much larger operations in other European countries other than the ones where their headquarters are. In contrast, HSR is more local by nature and shows distinctive features across different European countries. To capture the characteristics of both sectors, we focus mainly on four Western European countries, i.e., Italy, France, Spain, and Germany, which have the longest HSR lines within Continental Europe and have been widely regarded as the exemplars of European HSR system.

The rest of paper is organized as follows. Section 2 reviews the previous literature. Section 3 details the LCC-HSR interactions in both Japan and Western Europe. Section 4 compares the two cases and offers explanations for the differences. Section 5 contains concluding remarks.

2. Literature review

As major transport modes, LCC and HSR have gained increased attention in the literature. In recent years, there are many research studies addressing various issues of these two modes. For example, the study of Mason and Morrison (2008) shows that there are essential differences in airlines' business models even though they are all considered as LCCs, and they also discuss how these different business models affect airlines' profitability. Connectivity, which is one of the elements of airlines' business models in Mason & Morrison's paper, has also been discussed in the study of Li, Miyoshi, and Pagliari (2012). They found that the adoption of a dual-hub strategy has led to the decrease of network connectivity. Graham (2013) points out that the governance model of airports and their sizes play an important role in the airline-airport relationship, and the findings show that small airports have more flexibility to address the LCC customers because the formal economic regulation rarely influences small airports. Some literature also discuss the liberalization of LCC (Graham & Shaw, 2008; Hanaoka, Takebayashi, Ishikura, & Saraswati, 2014; Mason, Morrison, & Stockman, 2011), the evolution of LCC (Miyoshi, 2012), and the comparison between LCC and incumbent airlines (Fu, Lijesen, & Oum, 2006; O'Connell & Williams, 2005).

As for the literature of HSR, Levinson, Mathieu, Gillen, and Kanafani (1997) study the full costs of HSR infrastructure, which refers to the sum of the social and private costs, and they conclude that the cost of HSR is more expensive than the airline service, and it is more appropriate for the short distance routes. De Rus and Nombela (2007) suggest that local conditions, which hold the key to demand levels, and the degree of congestion of other transportation modes can determine whether the investment in HSR infrastructure is socially profitable or not. In particular, they found that a 500 km HSR corridor would produce net

³ One example is the Paris-Köln market, which is served by both Thalys HSR and the LCC Germanwings, with the LCC offering better schedules as well as lower fares.

⁴ In fact, whether the LCC business model can be successfully transferred to the long-haul markets is still a largely open question (e.g., Francis, Dennis, Ison, & Humphreys, 2007; Morrell, 2008; Wensveen & Leick, 2009), but in reality, very few successful cases have been observed.

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