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High speed rail and tourism: Empirical evidence from Spain

Daniel Albalate *, Xavier Fageda [1]

Universitat de Barcelona, Departament de Política Econòmica, Av. Diagonal 690, 08034 Barcelona, Spain

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ABSTRACT

This paper evaluates how changes in the provision of high-speed rail (HSR) services affect tourism outcomes in Spain, a tourist country with the newest and longest HSR network in Europe. To do so it employs an empirical strategy based on the differences-in-differences panel data method with double fixed effects. Data are provided by Spain's National Statistics Institute (INE) and cover 50 provinces over a 15-year time span (1998–2013). Our results provide mixed evidence about the impact of HSR accessibility on tourist outcomes. On the one hand, we find that air traffic is negatively affected by HSR and air traffic is a strong predictor of tourist arrivals. This suggests a negative indirect effect of HSR on tourist outcomes. On the other hand, HSR may have a positive (weak) direct effect on tourism. However, such result is conditioned on the measure of HSR accessibility and econometric technique used. Thus, the net effect of HSR on tourism outcomes is not consistently positive. This pattern might be attributed to a network design that does not respond to ridership needs and which has a substitution effect on air transportation, the main mode for long-distance tourist mobility.

1. Introduction

Transportation and tourism are closely related economic activities, so much so that promoting transportation infrastructure and guaranteeing efficient mobility are usually seen as contributing to the development of the tourism industry. As early articles have shown there is a well-established relationship between transport infrastructure and demand in the tourist sector (Chew, 1987; Martin and Witt, 1988; Abeyratne, 1993; Khadaroo and Seetanah, 2007, 2008). Thus, transportation acts on one of the determinants of a tourist destination, i.e., it improves accessibility to a particular location (Della Corte et al., 2013) and, moreover, it plays a critical role in mobility once tourists are at their destination. It is hardly surprising therefore that a number of recommendations have been forwarded for integrating transport and tourism policies (see Scuttari et al., 2013).

However, the impact of transportation on tourism is not solely positive. As Hall (1999) claimed, tourist mobility can be critical for such social concerns as inequality and sustainability. Thus, tourism mobility can produce negative externalities, with residents and tourists competing for scarce and constrained transport supply (Albalate and Bel, 2010), and other environmental impacts including climate change, air quality, noise, and nature/landscape (Peeters et al., 2007). In short, while all modes of transportation can produce both positive and negative externalities, transportation infrastructure and services can reasonably be considered allies of tourist development strategies. This point of view is typically the one adhered to by local policy makers and local actors in the tourist sector, as reflected by their frequent lobbying to receive more infrastructure and transport service supply.

* Corresponding author. Tel.: +34 934031131.
E-mail addresses: albalate@ub.edu (D. Albalate), xfageda@ub.edu (X. Fageda).
[1] Tel.: +34 934039721.

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All modes of transportation can be considered allies of tourism. Local transportation, for example, facilitates tourist mobility, while long-distance transportation is critical for the overall number of tourists that a destination receives, with airports being the primary gateways for tourist arrivals. However, the precise relationship of other modes of medium- and long-distance transportation with tourism has been largely overlooked in the literature. Among these modes, high-speed rail (HSR) represents a contemporary revolution in transportation technology and has been promoted in various countries around the world (Albalate and Bel, 2012).[2] HSR typically has a very specific passenger orientation, hence its importance for the tourism industry, but recent studies indicate that its main impact on mobility is to substitute airline passenger volumes, rather than to induce a higher number of new trips. Given that HSR may be weakening air transportation, this as yet unidentified net effect of HSR on tourism needs to be tested.

This paper contributes to the literature by calculating the impact of the opening up of new HSR lines on tourism outcomes. This policy is examined in Spain, Europe's leader in the adoption of this transportation technology and one of the continent's main tourist destinations. The analysis is conducted at the provincial level using an econometric strategy based on the implementation of the differences-in-differences panel data method. The overall aim is to test whether or not claims of positive externalities of HSR in the tourism industry are well founded.

The rest of the paper is organized as follows. In the next section, the related literature is reviewed in order to build hypotheses about the role of HSR and tourist outcomes. The development, design and characteristics of Spain's HSR network are then described. Section four outlines the empirical strategy adopted in evaluating the impact of HSR on tourism at the provincial. This is followed by a presentation and discussion of the main results. The last section offers some brief conclusions.

2. Literature review

Various studies of the deployment of HSR lines and their impact have addressed this specific relationship with the tourism sector. Thus, the improved accessibility of a tourist destination is reported as being expected to revitalize urban and business tourism (Delaplace and Perrin, 2013; Bazin et al., 2010; Masson and Petiot, 2009) and promoters associate the arrival of HSR with an improvement in the attractiveness of tourist destinations and as an opportunity to renew the tourist supply (see Delaplace et al., 2014; Feliu, 2012). A number of articles have forecast gains for the tourism industry from HSR links in Amsterdam (Riietveld et al., 2001), Kent (Gibb, 1986), Anaheim and San Diego (Murakami and Cervero, 2012), Melbourne and Canberra (Edwards, 2012), and the Chinese Provinces (Chen and Haynes, 2012) among others.

2.1. The ex-post evaluation of the relationship between HSR and tourism

However, results from ex-post evaluations of the impact of HSR are far from being so enthusiastic. A sound contribution is Bazin et al. (2006), which studied the impact of new TGV services on different economic sectors in France between 1990 and 1999. They reported that the new services failed to excite much curiosity, except for a somewhat sporadic impact on initial demand as passengers tried out the service. They argued that the availability of HSR gave value to already popular tourist destinations, but that it was insufficient to promote further tourist development, and that additional policies were required to sustain the initial demand shock. Interestingly, the authors found that the number of overnight stays fell and the profile of the typical visitor changed, to the extent that a restructuring was noted in the tourist industry. Thus, in some cities small hotels with limited services disappeared, while France's large national chains increased their offer and enhanced their quality to satisfy the demands of business tourism. The impact of HSR on leisure tourism appeared to be much more limited, and several projects developed on the basis of increased visitor numbers had to be abandoned (see Bazin et al., 2006, for specific examples).

City size appears to be an important determinant of the impact of HSR on tourism (Delaplace, 2012). Thus, Bazin et al. (2013) reported that the increase in the number of tourists attributable to a new HSR service was minimal in many small and medium-sized European cities, although positive effects were detected in intermediate cities pre-equipped with tourist amenities. SEEDA (2008) also examined HSR impacts on thirteen cities in Germany, the Netherlands, the United Kingdom and France and found that only a few cities experienced a revitalization of their tourist industries. In contrast, evidence from Asia points in the opposite direction. This is the case in Japan (Okabe, 1979), Taiwan (Cheng, 2009) and China (Wang et al., 2012; Chen and Haynes, 2012).

A recent study by Pagliara et al. (2015) have evaluated the impact of Madrid's HSR on tourist destination choice. Their results, which are closely associated with the findings reported herein, suggest that HSR is not a key determinant of tourists' choice of destination since the majority are international tourists arriving by air. However, Madrid's HSR appears to be attractive to international tourists when visiting nearby towns and cities. A similar conclusion is reached by Chen and Haynes (2015) in their study of the impact of Chinese HSR systems on international tourism demand. They find a small demand elasticity (0.057) with respect to an HSR station on international tourism arrivals. However, when the railway network density is included a larger impact is recorded.

[2] Here we understand HSR technology to refer to trains capable of reaching speeds of $\geqslant$250 km/h.