

The Scientific Knowledge of Spanish High-Speed Rail and its Relationship with Tourism through Bibliographic Analysis

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Spain has one of the most extensive networks of high-speed trains (AVE in its Spanish acronym) in the world, which has expanded to more than twenty cities since April 1992 (Gutiérrez, 2013). The network has attracted a great deal of interest from the media and also from the political, economic, social and academic-scientific fields (Bellet *et al.*, 2010). Within the latter, specialists from several branches of science have spent decades studying its processes and consequences. The results can be found in a large number of high-quality, multi-disciplinary papers that provide a wide range of conclusions.

This research focuses on an analysis of the scientific work conducted on the main regional and socio-economic aspects of the high-speed train network in Spain, with two aims: 1. to analyse the evolution and the topics included in scientific studies on the Spanish high-speed train network, based on published papers; and 2, to find out what research has been done on the relationship AVE/Tourism, based on the idea that, despite the consolidated line of research generated by the AVE in Spain, its relationship with tourism has received little academic attention.

Therefore, a detailed review of the scientific bibliography has been carried out, and texts with case studies in Spain were chosen. By design, the selection criteria applied were not especially strict, as a multi-disciplinary approach was sought, as shown in the academic focus of the lead authors included in the results: economics, engineering, geography and tourism studies. Only two conditions were required: the studies had to be published in books or articles in national and international scientific journals, and they had to focus on Spain.



More than one hundred texts were consulted, of which eighty-nine are cited in the text and bibliography. Of these, 91% are articles from forty-eight different journals, of which 39.6% are cited in JCR, and 31.25% in Scopus or the Web of Science. In addition, an analysis was made on the effects caused by routing the AVE to historic cities in Spain. This involved examining tourism data and applying Archer's gravity model. This provided insights into the reality of these cities and helped identify some of the problems affecting the development of research on tourism and the AVE.

The bibliographical review reveals that Spanish economists have written a great deal in an attempt to assess the social and production benefits of the heavy public investment in the AVE and the cost-profit ratio. These studies show that the Spanish network carries very few passengers, with official discourse over-estimating the positive effects of the infrastructure (Sánchez-Ollero *et al.*, 2014). Furthermore, the economists state that the benefits are unequal and concentrated in regions with the highest disposable income. Thus, decisions to build high speed train lines are based more on political interests and not spatial logic (Sánchez-Ollero, 2014; Albalade y Bel, 2011). In addition, more and more variables intervene in its ability to compete with other modes of transport (González-Savignat, 2004a; Román *et al.*, 2007; Pagliara *et al.*, 2012), and large growth in the high-speed train market is predicted (Martín y Nombela, 2007).

Civil engineers have contributed to the scientific output with an analysis of the current situation, and the challenges lying ahead for the high-speed network in Europe (Garmendia *et al.*, 2012). Their contributions show that the high-speed train could lead to a more complete and complex structuring of the territory (López, 2005), and that the quality of the service is linked to shorter journey times and a frequency commensurate with demand at each station. They also point out that it promotes decentralization and improves the integration of cities into metropolitan processes (Ureña, 2005, Ureña *et al.*, 2009), while the train seems to be providing an alternative to the car for tourism at medium and long distances.

Geographers found the high-speed network to be an excellent field of study, making them one of the most productive groups in their research of different issues. According to their studies, the train has become an established mode of passenger transport with rising demand and is an alternative to other means (Givoni, 2006; González *et al.*, 2005; Santos *et al.*, 2006). Nevertheless, investment is high and decisions are politically driven. Moreover, it creates significant spatial and socio-economic effects, which are also polarizing nature, as it is a very selective transport system that improves access to peripheral regions (Gutiérrez, 2004). They also state that it is an instrument for urban development that acts as a driving force for new urban fabric (González *et al.*, 2005), provided it is located in central areas (Facchinetti-Mannone, 2005). The geographers highlight the importance of the participation by the different stakeholders and members



of the public in the decisions on development and certain conflicts (Casellas *et al.*, 2011; Feliú, 2012; Bellet *et al.*, 2010, 2012).

It can be observed that the topics addressed by the different disciplines and the results obtained mostly coincide and complement each other.

The AVE/tourism binomial is not an area of study belonging exclusively to one discipline. However, research into this relationship has not provided a large number of contributions from any field, despite the RENFE state rail company's efforts to capture new customers, the inherent interest of the topic, and that many cities reached by the AVE are important urban (Barcelona, Madrid, Seville and Zaragoza), cultural (Cordoba, Segovia) and beach holiday (Alicante and Malaga) tourist destinations.

Economists have studied both mobility and socio-economic impacts (Masson y Petiot, 2009). Sánchez-Ollero *et al.* (2014) point out that Seville has reached its full market share, and Malaga could face stiff competition from the opening of the Madrid-Valencia line. Martín and Nombela (2008) found that the train was competitive when compared to travelling long distances by bus and plane, and to cars on short journeys. Coronado *et al.* questioned the usefulness of the high speed network for tourist trips lasting only one day.

In the field of geography, it is worth mentioning the works by Víctor Esteban (1998), Esther Gil (2010) and Òscar Saladié *et al.* (2016). The first deals with the location of the tertiary sector relative to the stations and concludes that the AVE benefits certain types of tourism (business and fairs), and is responsible for fewer overnight stays. The second analyses the influence of the Madrid-Segovia-Valladolid line on Segovia's tourism, and concludes that it would benefit from the arrival of the new line, as it would undergo a "pull effect". This would help the restaurant sector. It also states that the different stakeholders would play a key role in promoting and consolidating growth in the tourist sector, thanks to this new opportunity. In the third paper, the authors studied the effects of AVE service to Tarragona and its influence on choosing the *Costa Dorada* as a destination. They distinguish between tourists who go there for the first time, and for whom the AVE is a determining factor, and those who make repeat visits that can be attributed to inertia, habit or because they are fond of the place.

The analysis demonstrates that there has been little research in Spain on the relationship between the AVE and tourism, unlike in France, despite the fact that it would be useful in gaining a better understanding of some of the regional processes and impacts. Moreover, it would help set up strategies to promote the destinations based on market segment and type of visitors. There are several reasons explaining the scarcity of this line of research: 1. lack of official information; 2. the lack of specialized data sources making it possible to study the relationship; 3. the relevance of day trip, which is a subject difficult to define. 4. interference of several factors (resources, agents, strategies, etc.); and 5. the strong impact of the economic crisis.



Such reasons do not make the research impossible, although they do constitute an important obstacle that could be overcome by designing methodologies that include surveys, interviews and field work. This would be costly in terms of both money and time, making the current collaboration among professionals of different disciplines or research areas essential. Subjects of high interest could be addressed and tackled on several levels. This would answer numerous questions, such as: What role has the AVE played in creating, consolidating and promoting destinations? What are the effects depending on the type of city? What are the influencing factors? What relationships and competition exist among the destinations? Is there a link between the type of traveller and their reasons and the frequency of revisiting the destination? How has the location of stations affected processes of *tertiarization* and *touristization* in the surrounding area? What is RENFE's role as an agent? And is the AVE a real and effective marketing strategy for the region?

