Measuring the Impact of High-Speed Rail on Economic Performance: Evidence for the Madrid-Barcelona Corridor

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ABSTRACT

Investments in major transport projects are frequently justified, or even planned, on the basis of presumed positive transformational effects on the spatial economy. The extent to which such effects actually materialise has been the subject of a large academic literature spanning several decades (e.g. Munnell, 1992, Gramlich, 1994, Rietveld, 1994, Boarnet, 1997, Button, 1998, Banister and Berechman, 2000). In the policy domain, this issue now features prominently in contemporary debates over the benefits of high-speed rail investment. In the UK, for instance, supporters of a proposed high-speed rail link from London to the North of England have argued that economic growth and job creation will be stimulated along the route of alignment and that the investment will help 'rebalance' the national economy by reducing wealth inequalities (DfT, 2012).

High-speed rail (HSR) investments are worthy of attention, not only because they are topical, but also because they offer a valuable opportunity to study the economic impacts that may arise via improvements in the long-distance connectivity of an economy. These are typically large investments, both in terms of physical capacity and financial capital, and it is therefore worth considering whether the investment has delivered positive impacts to the economic performance of the local economies receiving the investment.

Previous evidence on the impact of high-speed rail lines on the local economies of the cities and/or regions served tends to be uncertain (e.g. de Rus and Nash, 2007). Evidence for the French high-speed rail network, the oldest in Europe, suggests that there has been a tendency towards the spatial concentration of activities around the major cities served by high-speed rail. This appears to be the case for TGV Sud Est and TGV Nord, where economic activities have tended to concentrate in Paris and Lyon and Paris and Lille respectively (e.g. Vickerman and Ulied, 2009). There is no conclusive evidence on a positive effect of high-speed rail towards a more balanced redistribution of activities across space and more balanced regional economic growth (i.e., regional cohesion).

During the period between 2000 and 2010 Spain has carried out the largest high-speed rail construction programme in Europe. During this decade four new corridors opened between 2005 and 2010, in addition to the Madrid-Seville HSR line which had opened in 1992. As a result, in 2011 the Spanish HSR network became the largest in Europe and the highest rate of HSR kilometres per capita in the world (UIC, 2010). Investments in high-speed rail in Spain

have been justified by alleged positive effects on regional and national economic growth (e.g. Albalate and Bel, 2012). However, many of these benefits remain unclear and have yet to be confirmed.

There is little evidence on the regional economic impacts of high-speed rail in Spain. Existing studies of high-speed rail in Spain demonstrate that both the Madrid-Seville and Madrid-Barcelona corridors have had a strong negative impact on the air transport sector (e.g. Jiménez and Betancor, 2012), but there is no actual evidence on the effect on the local economies of the cities and/or regions served. In the case of the Spanish high-speed rail, there is also evidence suggesting that it has promoted metropolitan integration through increased commuting over shorter and medium distances between main cities (e.g. Madrid, Barcelona) and small and medium size cities (e.g. Ciudad Real) (e.g. Garmendia et al., 2012).

In this research we carry out an ex-post analysis causal analysis based on a difference-in-differences (DID) method to investigate whether the Madrid-Barcelona high-speed rail corridor has delivered economic benefits to the areas served. The DID estimator consists of taking the difference in the average outcome in the treated group before and after the treatment minus the difference in the average outcome in the untreated group before and after the treatment. In order to avoid the violation of the parallel trend assumption between the treated and the untreated groups we also use data for Portuguese regions, as these should not have been affected by the Madrid-Barcelona high-speed corridor.

Our results indicate that the Madrid-Barcelona high-speed rail corridor has not produced any positive transformational effects on the economic growth of the provinces receiving the high-speed corridor. Differences in the economic performance between these regions and those that did not receive a high-speed rail investment have not been altered by the investment, which suggests that the alleged positive effects proclaimed by the Spanish government cannot be confirmed empirically for the Madrid-Barcelona high-speed rail corridor, at least not in the short to medium term.