

# The impact of railroads on innovation: new evidence from Italy, 1855-1914

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## **Abstract**

Transport infrastructures are supposed to be a driving force in the diffusion of knowledge and inventive activities. Since the pioneering study of Sokoloff (1988), which established a link between inventive activities and the proximity to navigable waterways in the United States, there has been a stream of research studying the impact of infrastructural reforms on the rate and direction of inventive activity in different historical contexts (e.g., Andersson, Berger, and Prawitz 2021; Tsiachtsiras 2023). In Italy, the railroad expansion coincided with the first steps of the industrialization process. This makes Italy a relevant case-study to historically assess the role of infrastructural development in latecomer industrializing countries.

This paper analyses the impact of railroad expansion on municipal-level measures of innovation in Italy by using two new geo-localized datasets. The first comprises all patents registered in Italy by Italian residents from 1855 to 1914, while the second provides a GIS database indicating the year of construction of all Italian railroad stops. In our main exercise, we use a staggered difference-in-differences empirical approach (Callaway and Sant'Anna 2021).

We find that railroads impacted on the intensity and diffusion of innovation only during the wave of railway construction motivated by nation-building purposes (about 1861-1880). The average effect ranges from an increase of 2.89 to 3.84 new patents by the municipality per 100,000 inhabitants. When restricting the sample to small municipalities, the effects are statistically significant only for the period between 1862 and 1871, suggesting that only railways constructed just after the Unification could guarantee market access and lowered knowledge barriers. Part of this effect must be attributed to the relocation of economic activity from neighboring areas to municipalities that received train stops. In contrast, we do not find any effect of the second wave of railroad construction (1877-1896), specifically designed to connect more remote areas.

## **References**

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