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A dynamic spatial econometric diffusion model with common factors: the rise and spread of cigarette consumption in Italy

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Abstract
This paper adopts a dynamic spatial panel data model with common factors to explain the non-stationary diffusion process of cigarette consumption across 69 Italian provinces over the period 1877-1913. The CD-test of Pesaran (2015a), the exponent $\alpha$-test of Bailey et al. (2015), the cross-sectionally augmented panel unit root test of Pesaran et al. (2013), and the spatial stability test of Yu et al. (2012) are used to show that both global common factors and local spatial dependence are important drivers of the propagation of cigarette demand over this period and to determine the point at which the hypothesis of stationarity no longer needs to be rejected in favor of a unit root. The direct and indirect effects derived from the coefficient estimates of the model show that cigarettes were a normal good with an income elasticity of 0.4 and a price elasticity -0.4 in the long term. This price elasticity of -0.4 consists of a direct effect of -0.54 in the own region and a spillover effect to other regions of 0.15. This positive spillover effect is in line with previous spatial econometric studies which investigated cigarette demand in the U.S. states over a more recent period.

Keywords: diffusion, stationarity, spatial dependence, common factors, cigarette demand

JEL Classification: C21, C23, N33, N93, R22

1 Introduction
This paper sets out a dynamic spatial panel data model with common factors to explain cigarette diffusion in Italy over the period 1877-1913. The observations

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