Partial bans on smoking in public places fail, only a total tobacco ban works: inferring the causal impact on cigarette sales using an interrupted time series analysis

Jaime Pinilla, Beatriz G Lopez-Valcárcel, Miguel Ángel Negrín

***Acknowledgements and Funding**: This study was supported by the Spanish State Programme of Research, Development and Innovation, project ECO2013-48217. http://invesfeps.ulpgc.es/en*

This is a preliminary draft. Please do not cite or distribute without permission of the authors

Corresponding author
Jaime Pinilla, Department of Quantitative Methods for Economics and Management, University of Las Palmas de Gran Canaria, Campus de Tafira, Las Palmas de Gran Canaria, Spain
E-mail: jaime.pinilla@ulpgc.es
Phone: +34 928 452821
Fax: +34 928 458225

Abstract

In January 2006 the Spanish government enacted a tobacco control law which, among other aspects, banned smoking in bars and restaurants, with exceptions depending on the floor space of the premises. This approach became known as the "Spanish Model". In January 2011, further legislation in this area was adopted, removing these exceptions. In this paper, we estimate the effect of these two bans on cigarette sales. We approach this problem using an interrupted time series analysis accounting for potential effects of autocorrelation and seasonality. The data source used was the official data on monthly legal sales of cigarettes in Spain, from January 2000 to December 2015 (excluding Canary Islands and the Autonomous cities of Ceuta and Melilla). The endogenous variable is the log-transformed monthly per-capita manufactured cigarettes plus hand rolling tobacco sales. We use the sum of both types of tobacco products because in recent years it has been observed an increase in the consumption of hand rolling tobacco, indicating a shift from manufactured cigarettes. As control variables we use the weighted average of selling tax burden on cigarettes plus hand rolling tobacco one pack and log-transformed per capita household disposable income at 2000 prices. Total Ban coefficient denote significant change in level in period immediately following intervention initiation with a significant average percent decrease in per-capita tobacco sales of 9.81% (P<0.05, CI=-19.2%; -0.4%). For the control variables, we can say that for an 1 euro increase in tax burden on cigarettes plus hand rolled one pack, we expected about 16.54% of decrease in per-capita tobacco sales (P<0.01, CI=-27.2%; -5.9%). Respect to month variable we can see a peak season in May, June, July, August, September and December related, with and expected mean percent difference in per capita tobacco sales between these months and January (reference) about 25%. In Spain the price differential has always remained above the threshold at which visitors are willing to export the maximum amount allowed under the customs legislation (2 cartons of cigarettes, 400 units maximum per person over 17 years in the case of the UK). An important proportion of cigarette sales in Spain correspond to purchases by non-residents. Finally if we change per capita household disposable income by 1%, we did expect y to change by 0.96% percent (P<0.05, CI=0.16%; 1.98%), holding the other predictor variables constant. Our results indicate that the partial ban was not effective in reducing the number of cigarette packs sold in Spain, but that the total ban contributed significantly to reducing cigarette consumption.

Keywords: Smoking ban, Policy evaluation, Cigarettes, interrupted time series analysis.