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Where to snuff the puff? Relative effectiveness of U.S. smoking control policies

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ABSTRACT

This research examines the relative effectiveness of various smoking control initiatives in lowering U.S. smoking prevalence. The main contribution lies in considering alternate state-level restrictions on retailers as well as smokers. Greater restrictions on smokers lower smoking prevalence, while those directed at retailers are largely ineffective. Upon disaggregation, territorial restrictions banning smoking in restaurants are found to be effective, whereas those in workplaces and in bars do not appreciably lower smoking prevalence. We also find some gender differences in the effectiveness of smoking restrictions. These findings are generally robust to alternate model specifications.

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1. Introduction

Policymakers in recent years have been trying a range of initiatives to combat smoking. The shift of policy focus from the traditional price/tax measures to other measures, especially geographic or territorial smoking restrictions, came after the ill-health effects of second-hand smoke came to light relatively recently. Another contributing factor to this broader smoking control policy focus has been the recommendations of 1998 Master Settlement Tobacco Agreement in the United States and the wider and more recent, Framework Convention on Tobacco Control internationally. These wide ranging agreements recommended comprehensive smoking control policies that should involve a combination of price-based and non-price initiatives.

Among the non-price smoking control measures, the geographic smoking restrictions come in many forms including those directed at smokers (home, workplace or public place smoking bans), and restrictions aimed at tobacco retailers (point of sale limitations, or licensing requirements), see Fig. 1. Broadly speaking, the territorial restrictions either increase the costs of consuming or selling tobacco products. A number of researchers have examined different aspects to the efficacy of territorial restrictions (see Emory et al. (2010), Shields (2007) for examples, and Chaloupka and Warner (2000), Goel and Nelson (2008), and U.S. Department of Health and Human Services (2000) for literature reviews). The overall results regarding the effectiveness of geographic smoking bans are mixed and the quest for more effective smoking-control measures continues (see Lanoie and Leclair, 1998; Reid et al., 1995; Tauras, 2005). The major studies are reviewed in Goel and Nelson (2008, p. 87) and results regarding the effectiveness of territorial smoking restriction show differences in their effectiveness across nations and the data employed (i.e., the time period of a study and whether it is based on micro-data or aggregate data). Relatively speaking, the effectiveness of comprehensive smoking bans seems greater than individual bans (see Rhoads (2012) for recent evidence in this regard).

This paper contributes to this line of research by examining the effects of various recent state-level bans on U.S. smoking prevalence.[1] In particular, both limitations directed at tobacco retailers and at smokers are considered, with the latter also disaggregated across different categories. The nature and enforcement of these restrictions are qualitatively different. Are the point-of-sale smoking restrictions as effective as smoking bans in reducing smoking?

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[1] In a slightly related study, Dunham and Marlow (2000a) use survey data to examine the effects of smoking bans on businesses.

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Table 1
Variable definitions, summary statistics, and data sources.

Variable	Definition (mean; std. dev.)	Source
SmkRt	Smoking prevalence rate (%), 2009 (18.54; 3.28)	Statistical Abstract of the United States
Price	Retail price of cigarettes (cents/20-pack) (545.46; 99.70)	Tax Burden on Tobacco (2010)
PBor	Lowest cigarette price in a border state (cents/20-pack) (475.30; 76.41)	Tax Burden on Tobacco (2010)
INC	Per-capita disposable income ($) (36,430.37; 6,046.34)	Statistical Abstract of the United States
TAX	State excise tax on cigarettes (cents/20-pack) (132.49; 85.83)	Tax Burden on Tobacco (2010)
Producer	Dummy variable identifying the six major tobacco producing states (GA, KY, NC, SC, TN, VA) (0.12)	
LclAdv	Count variable denoting whether a state allows local tobacco advertising and promotion laws in display (yes = 1), promotion (yes = 1), and sampling (yes = 1), range 0–3, 2009 (2.22; 1.19)	CDC (2010)
RetLicn	Count variable denoting whether a state imposed retail licensing requirements on over the counter tobacco sales (yes = 1) and on vending machines (yes = 1), range 0–2, 2009 (1.59; 0.73)	CDC (2010)
TERR	Restrictions on smoking locations (smokefree workplaces = 1, smokefree restaurants = 1, smokefree bars = 1), range 0–3, 2009 (1.57; 1.37)	CDC (2010)
WorkDum	Dummy variable identifying states (=1) with 100% smoke free workplaces, 2009 (0.59)	CDC (2010)
RestDum	Dummy variable identifying states (=1) with 100% smoke free restaurants, 2009 (0.55)	CDC (2010)
BarDum	Dummy variable identifying states (=1) with 100% smoke free bars, 2009 (0.43)	CDC (2010)
SmkRtM	Male smoking prevalence rate (%), 2009 (20.17; 3.55)	Statistical Abstract of the United States
SmkRtF	Female smoking prevalence rate (%), 2009 (17.01; 3.34)	Statistical Abstract of the United States

Notes: All data are based on annual state-level observations for the year 2009, or the closest year available.

Retailer-directed restrictions include (i) whether a state allows local laws limiting advertising and promotion restrictions on the display, promotion or sampling of tobacco products (*LclAdv* in Table 1) and (ii) whether a state imposed retail licensing requirements on tobacco vending machines and over the counter sales (*RetLicn*). These retailer restrictions enable better enforcement of regulations such as bans on cigarette sales to minors and for authorities to more effectively collect tax revenues. In 2009, 37 states required licensure for both over-the-counter and vending machine tobacco sales (Centers for Disease Control and Prevention, 2010). On the other hand, smokers facing geographic smoking bans might give up smoking if they view the costs of inconvenience as being high, while other smokers might consider such restrictions to be mildly inconvenient and continue smoking in other locations (see Gellhorn (1969) for a nice discussion). Consideration of these aspects is especially important in light of the fact that in recent years, with limitations on outdoor tobacco advertising in place in many jurisdictions, there have been growing calls for better monitoring of tobacco sales at the point-of-sale.

Different aspects of geographic restrictions targeting the smoker include (i) states with (100 percent) workplace smoking bans (*WorkDum*); (ii) states with overall restaurant smoking bans (*RestDum*); and (iii) states that ban smoking in all bars (*BarDum*). There may be different motivations for instituting these regulations. For instance, one can envision workplace smoking restrictions as protecting the interests of nonsmoking co-workers who are in close proximity to smokers not out of personal choice (i.e., workers generally do not get to choose the location of their workstations – think about workers along an assembly line), while restaurant and bar going nonsmokers do not face similar compulsions (i.e., such patrons have the choice of where they sit or even of ordering take-out). In the political economy context, these regulatory differences across states might have been driven by the demographic compositions of individual states and by the strength of the business lobbies. While workplace smoking restrictions have received some attention in the literature (see Goel and Nelson (2008)), the focus on restaurants, bars and retailers is new.[2] Our results show that while most bans are ineffective, some are uniquely shown to be effective.

2. Model and data

The basic underlying framework for examining the determinants of smoking prevalence borrows from the extant literature that controls for the effects of cigarette prices and personal income, with many studies also including border-state cigarette prices to allow for the effects of cross-border cigarette sales (see Chaloupka and Warner (2000), U.S. Department of Health and Human Services (2000) for examples; also see Smith and Stutts (1999)). We augment the basic structure by including various territorial smoking restrictions directed at tobacco retailers and at smokers (see Section 1 and Fig. 1).

The formal estimated equation takes this general form (with subscript i denoting a state)

$$SmkRt_i = f(Price_i,\ PBor_i,\ INC_i,\ Retailer\ Ban_{ij},\ Smoker\ Ban_{ik}) \quad (1)$$

$i = 1, \ldots, 49$, $j = LclAdv$, $RetLicn$, and $k = TERR$, $WorkDum$, $RestDum$, $BarDum$.

The dependent variable in our cross-sectional analysis, *SmkRt*, is the percentage of the population that smoked in a state.[3] In 2009,

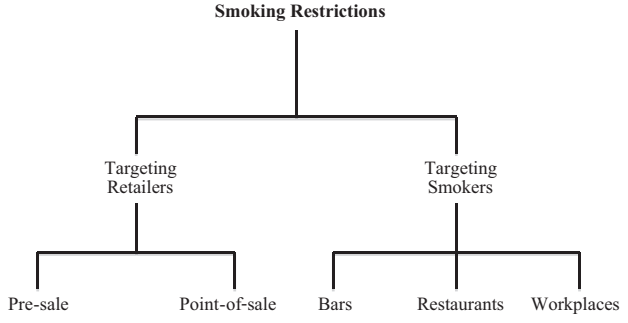

Fig. 1. Various smoking restrictions.

[2] Using Canadian survey data, Carpenter et al. (2010) found public-place smoking laws to be ineffective in reducing smoking but were effective in influencing environmental tobacco smoke in bars and restaurants.

[3] The main reason in employing a cross-sectional approach to study relative effectiveness of various state-level smoking restrictions was the inability to obtain information on how the different smoking control restrictions across individual states have evolved over time (i.e., the exact year when each state decided to enact a particular smoking restriction (i.e., workplace, restaurant or bar restrictions over time across states) and whether there were any reversals in the laws over time) – see CDC (2010) for details. Data on the cigarette prices and income variables is available for almost fifty years and some scholars have studied the effects of aggregate economy-wide smoking restrictions (Goel and Nelson, 2012b). With respect to population subgroups, we consider the effects on male and female smokers in Table 3. Youth, on the other hand, would be less susceptible to some of these restrictions, since they are less likely to be formally employed and they may face age-based entry restrictions to bars (see Wakefield et al., 2000).