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One last puff? Public smoking bans and smoking behavior

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ABSTRACT

This paper investigates the short-term effects of public smoking bans on individual smoking behavior. In 2007 and 2008, state-level smoking bans were gradually introduced in all of Germany's federal states. We exploit this variation to identify the effect that smoke-free policies had on individuals' smoking propensity and smoking intensity. Using rich longitudinal data from the German Socio-Economic Panel Study, our difference-in-differences estimates show that the introduction of smoke-free legislation in Germany did not change average smoking behavior within the population. However, our estimates point to important heterogeneous effects. Individuals who go out more often to bars and restaurants did adjust their smoking behavior. Following the ban, they became less likely to smoke and also smoked less.

1. Introduction

Smoking has serious short- and long-term health impacts. Both active and passive smoking have indeed been identified as leading causes of preventable death (World Health Organization, 2009). In recent years, a growing awareness of the deadly effects of smoking has led to the enactment of tobacco control policies throughout the industrialized world. Public smoking bans have been implemented in many countries as a means of reducing the exposure of non-smokers to second-hand smoke. Yet such bans also impact the behavior of smokers—for example, by affecting smoking cessation or smoking intensity in smokers, smoking initiation in younger age cohorts, and the overall prevalence of smoking within the population. To date, however, surprisingly little research has been done on behavioral changes in smokers following the introduction of smoking bans.

This paper investigates the short-term effects of public smoking bans on individual smoking behavior in Germany, a country with relatively high smoking rates among industrialized countries (Tobacco Atlas, 2009). In 2007 and 2008, state-level smoking bans were gradually introduced in Germany. In this study, we exploit the fact that smoking bans were introduced on different dates in different states to identify the effects that smoking bans had on individuals' smoking propensity and intensity. The individual-level data employed in this study are taken from the German Socio-Economic Panel Study (SOEP), an annual household panel of roughly 20,000 individuals in around 11,000 households.

Our results show that the introduction of smoke-free policies in Germany did not change the population's average smoking behavior in the short term: following the introduction of smoking bans, individuals were neither less likely to smoke on average, nor did they smoke fewer cigarettes. However, individuals who reported going to bars and restaurants regularly—and hence were more exposed to the constraints of public smoking bans in everyday life—*did* adjust their smoking habits. People who go out more often to bars and restaurants (i.e., individuals with a propensity to go out above the median) exhibited a two percentage point lower propensity to smoke following the introduction of a smoking ban. Their likelihood to smoke regularly (ten or more cigarettes per day) also fell, as did their average daily cigarette consumption. The effects were even more pronounced for individuals in the top quartile of

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those regularly going to bars and restaurants, leading to a four percentage point reduction in these individuals' smoking probability after implementation of the smoking ban. Our findings therefore suggest that smoking bans can be an effective tobacco control policy, at least for certain subgroups of the population. As such, they can provide important health benefits beyond reducing the exposure of non-smokers to second-hand smoke—which is their immediate and prime objective.

This study makes several contributions to the literature. Our study is the first to investigate the effects of smoking bans on smoking behavior in a country with high smoking rates. Research to date has concentrated on the United States, where smoking rates are considerably lower than in European countries, particularly among young adults aged 18–25 (Tobacco Atlas, 2009).[1] Smoke-free laws may have different effects on individual smoking behavior when overall smoking prevalence in a country is high and when potential peer group effects are stronger. Furthermore, smokers in a country with low smoking prevalence, like the US, are likely to differ in a number of characteristics from smokers in European countries, where smoking is more widespread, (still) more socially acceptable, and less of a lower-class phenomenon.[2] Second, our data contain a wealth of information on respondents' socio-economic characteristics and behavior, including the frequency of going out to bars and restaurants. This information enables us to examine whether the effects of smoking bans vary across individuals who are affected to different degrees by the law depending on how frequently they go out. Individuals who regularly go to bars and restaurants are most affected by public smoking bans. All else being equal, smoking bans should therefore exert the greatest effect on these individuals. Third, to identify the causal effects of public smoking bans, we are able to exploit variation in the exposure to smoking bans over time, across states, and also within states. Smoking bans have gradually been introduced in all German federal states within a relatively short period of time. Our data enables us to separate time and reform effects even within federal states, as the interview months of survey respondents in the SOEP vary within states. Exploiting this variation reduces the risk that potential unobserved effects coinciding with the introduction of public smoking bans and influencing individuals' smoking behavior might bias our estimates.

The remainder of the article is structured as follows. Section 2 discusses the timing and coverage of smoking bans in bars and restaurants in Germany. Section 3 reviews the relevant literature, and Section 4 describes the data. Section 5 presents our estimation methods and results. Several robustness checks are discussed in Section 6. Finally, Section 7 summarizes our main findings and concludes.

2. Institutional background

The implementation of smoking bans in Germany is the responsibility of the individual states. On March 22, 2007, state health ministers convened and agreed to introduce public smoking bans in the hospitality industry (bars, restaurants, and dance clubs) (Blum, 2007). As a result, smoke-free policies were implemented in all of Germany's sixteen federal states. The state smoking bans went into effect on different dates, however, and varied to some extent in their scope. Table 1 presents an overview of when each of the sixteen federal states put its ban into effect. Baden-Wuerttemberg was the first to implement a state smoking ban (in August 2007). It was followed in October 2007 by Hesse, in November 2007 by Lower Saxony, and in January 2008 by Bavaria, Hamburg, and Schleswig-Holstein. In February 2008, Rhineland-Palatinate and Saxony imposed state smoking bans, followed by six further states in July 2008: Berlin, Brandenburg, Bremen, North-Rhine Westphalia, Saxony-Anhalt, and Thuringia. Mecklenburg-Western Pomerania was the last to ban smoking (in August 2008). All of the states, except Bavaria, continued to allow smoking in separate "smoking rooms" in bars and restaurants if this was possible, and some states allowed for additional exemptions.[3] Due to the exceptions granted, state smoking bans in Germany can be described as less comprehensive than those introduced in other countries such as the United States, England, Ireland, and Scotland. Nevertheless, initial empirical evidence suggests that cigarette sales at vending machines in bars and restaurants declined, on average, by 15 percent following the introduction of state smoking bans in Germany (Kvasnicka, 2010).

Table 1
Dates of enforcement of state smoking bans in Germany.

Federal state	Enforcement of state smoking bans
Baden-Wurttemberg	August 2007
Bavaria	January 2008
Berlin	July 2008
Brandenburg	July 2008
Bremen	July 2008
Hamburg	January 2008
Hesse	October 2007
Lower Saxony	November 2007
Mecklenburg-West Pomerania	August 2008
North Rhine-Westphalia	July 2008
Rhineland-Palatinate	February 2008
Saarland	June 2008
Saxony	February 2008
Saxony-Anhalt	July 2008
Schleswig-Holstein	January 2008
Thuringia	July 2008

Note: Information on individual states was compiled from original law texts and from a survey of state-level smoking ban legislation by the German Hotels and Restaurants Federation (DEHOGA, 2008). All smoking bans were enforced at the start of the month with the exception of Rhineland-Palatinate, which introduced the smoking ban on February 15, 2008.

Opposition to smoking bans in Germany was fierce from the start. Bar owners even filed a constitutional complaint against the bans in two states (Berlin and Baden-Wuerttemberg). Furthermore, in July 2008, the German Federal Constitutional Court ruled parts of the smoking ban legislation unconstitutional on the grounds that it discriminates against small pubs that cannot create separate rooms for smokers. Federal states had up to December 31, 2009, to modify their smoking bans. Up until this date, bars smaller than 75 square meters were allowed to declare themselves as "smoking pubs" if young people aged 18 or less were denied entry and if food was not served. As it turned out, the majority of states followed the Constitutional Court's ruling by simply adding this exemption clause to their state smoking ban legislation.

The timing of state smoking bans may be related to specific state characteristics. In the analysis, we will control for state fixed effects. It is therefore not necessary that the timing of state bans be unrelated to state characteristics (see Black et al., 2005). Nevertheless, it

[1] Smoking prevalence in continental European countries such as Germany, France, Belgium and the Netherlands ranges from 30 to 39 percent, compared to only 23.6 percent in the US (Tobacco Atlas, 2009). With about 35 percent of adults smoking, the smoking prevalence in Germany exceeds that of the US by nearly 50 percent.

[2] For example, more than 50 percent of all health professionals in Germany smoked in 2004. In the US, the respective share was less than 10 percent (Tobacco Atlas, 2009).

[3] For example, twelve states permitted smoking in specially designated smoking rooms in dance clubs, two permitted smoking rooms in dance clubs with a minimum age of 18, and several state laws allowed for the establishment of smoking clubs (Hamburg, Bavaria, Hesse, and North-Rhine Westphalia).