THE EFFICACY OF STATE-LEVEL ANTISMOKING LAWS: DEMAND AND SUPPLY CONSIDERATIONS

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Abstract
Utilizing published ratings of state-level antismoking laws, this paper addresses the merits of limits to smoking in public places and restrictions on youth access to tobacco. Consistent with the literature, we find that clean indoor-air laws reduce demand. However, by failing to address supply considerations, the literature to date presents a biased reaction of consumption to antismoking laws. Indeed, we find that clean indoor-air laws also intensify competition, which suggests that producers mitigate demand reductions by lowering price. Nonetheless, restrictions to youth access, as well as enforcement and penalty efforts, have little impact on cigarette consumption across states. (JEL L13, L66)

Introduction
Few products have generated as much public debate over the merits of consumption as tobacco. Indeed, in response to the volume of evidence linking smoking to illness, since the 1960s the U.S. government has employed a variety of tools, such as published health warnings and limits on the marketing of tobacco products, to reduce the incidence of smoking. Many studies confirm the importance of these early policies in contributing to reductions in the national demand for cigarettes in the United States. [See, for example, Hamilton (1972), Warner (1977), Kao and Tremblay (1988), and Tremblay and Tremblay (1995).]

Since the 1970s, however, state governments have increasingly joined the antismoking campaign by placing limits on smoking. For instance, in response to the lobbying efforts of nonsmokers' groups, who cite evidence that secondhand smoke has detrimental health effects, states have enacted clean indoor-air laws to limit smoking in public places, such as restaurants, schools, and work sites. Furthermore, states have passed legislation to restrict youth access to tobacco products. Similar to studies of national demand, other studies find that restrictions on smoking at the state-level also reduce the demand for cigarettes. [See, for example, Chaloupka and Saffer (1992), Keeler et al. (1993), Chaloupka et al. (1997), and Yurekli and Zhang (2000).]

Yet several limitations of the existing literature on smoking restrictions warrant further study of the efficacy of state-level policies. First, by addressing only the demand response to clean indoor-air laws and youth access restrictions, most studies ignore supply-side considerations. This is unfortunate, however, as some studies find that antismoking policies also affect producer behavior. [See, for example, Seldon and Doroodian (1989), Eckard (1991), Tremblay and Tremblay (1995), Keeler et al. (1996), and Gallet (2003).] Second, heretofore neglected in the literature, recently published rating systems of state laws allow us to account not only for the severity of smoking restrictions across states but also for the strength of enforcement and penalties for violating the law. [See Alciati et al. (1998) and Chriqui et al. (2002).]

In this paper we address these issues by estimating a model of state-level cigarette demand and supply. Briefly, the results are consistent with the literature in that restrictions on smoking in public places reduce cigarette demand. Yet we also find that more restrictive clean indoor-air laws

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coincide with pricing closer to marginal cost. Hence, with such laws intensifying competition within the industry, the availability of supply is increased. Furthermore, the nature of the anti-smoking policy matters, as restrictions on youth access and enforcement/penalty mechanisms have no significant impact on state-level demand and supply.

The remainder of the paper is organized as follows. While it is expected that antismoking policies reduce cigarette demand, it is less clear why such policies may also affect supply. Hence, the next section discusses the supply-side considerations in greater detail. This is followed by the presentation of an empirical model. The data and estimation results are then discussed, with a summary provided in the final section.

Supply-Side Considerations

Although an intended goal of clean indoor-air laws and restrictions on youth access is to reduce smoking incidence by reducing demand, if such policies also affect supply via changes in the nature of competition within the market, then existing studies that account only for the demand response to antismoking policies may infer too little or too much of a reaction of consumption to such policies. In particular, if a given antismoking policy leads to a decrease (increase) in competition within the industry, then this will further decrease (promote) consumption by decreasing (increasing) the availability of supply.

Indeed, several arguments can be made for antismoking laws also affecting supply. For instance, consider the impact of such policies on firm expectations of the future. Given the plethora of antismoking policies, coupled with recent efforts to hold the industry more liable for the healthcare costs associated with smoking, a reasonable forecast would be to expect lower future profit in the industry. Depending on the story, however, this can either decrease or increase competition. For example, with profit expectations reduced, the desire for firms to enter the market will be reduced; and with less entry, or similarly less need to deter entry, competition will be reduced. Alternatively, following several game-theoretic studies of oligopoly behavior, if firms expect profit to be lower in the future, this will create the temptation to cheat on any cooperative agreement, thereby increasing competition in the market.² [See, for example, Rotemberg and Saloner (1986), Haltiwanger and Harrington (1991), and Bagwell and Staiger (1997).]

Other studies suggest that the nature of competition may change as cigarette producers attempt to mitigate the reductions in demand resulting from antismoking policies. For example, Seldon and Doroodian (1989) find that cigarette producers attempted to bolster demand by increasing advertising in response to health warnings throughout the 1960s. And since several studies find that advertising affects the degree of competition in the cigarette industry, this provides an avenue for earlier policies to affect supply.³ [See, for example, Tremblay and Tremblay (1995), Farr et al. (2001), and Gallet (2003).] Furthermore, with respect to clean indoor-air laws, Keeler et al. (1996) find that cigarette producers price-discriminate across states and reduce price closer to

¹ This is not to say that the supply side of the cigarette industry has been ignored in the literature. Indeed, numerous studies, including Mitchell and Mulhern (1988), Eckard (1991), Barnett et al. (1995), Tremblay and Tremblay (1995), Keeler et al. (1996), Armade et al. (1998), and Gallet (2003), address firm behavior in the context of various issues. However, per clean indoor-air laws and restrictions on youth access, the literature has been fairly silent regarding the supply side.

² Strictly speaking, the game-theoretic literature addresses strategies to maintain cooperation in a cartel setting, whereby cheating on a cartel agreement is deterred by the threat of punishment in the future. As such, with expected future profit reduced, the temptation to cheat is increased because the cost of cheating (in terms of the sacrifice of future collusive profit during the punishment period) is reduced. To sustain cooperation, the cartel prices more competitively when expected future profits are lower to reduce the gains from cheating.

³ Other studies, such as Mitchell and Mulhern (1988), Eckard (1991), and Barnett et al. (1995), also find changes in competition resulting from antismoking policies throughout the 1960s.