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# The importance of peer effects, cigarette prices and tobacco control policies for youth smoking behavior

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## Abstract

This paper expands the youth cigarette demand literature by undertaking an examination of the determinants of smoking among high school students incorporating the importance of peer effects and allowing cigarette prices (taxes) and tobacco control policies to have a direct effect and an indirect effect (via the peer effect) on smoking behavior. To control for the potential endogeneity of our school-based peer measure we implement a two-stage generalized least squares estimator for a dichotomous dependent variable and implement a series of diagnostic tests. The key finding is that peer effects play a significant role in youth smoking decisions: moving a high-school student from a school where no children smoke to a school where one quarter of the youths smoke is found to increase the probability that the youth smokes by about 14.5 percentage points. The results suggest that there is a potential for social multiplier effects with respect to any exogenous change in cigarette taxes or tobacco control policies. © 2005 Elsevier B.V. All rights reserved.

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## 1. Introduction

Numerous studies have examined the impact of prices and public policies on youth smoking behavior and have been the backbone for formulating anti-smoking policies (Chaloupka and Warner, 2000; USDHHS, 1994, 2000). While such research provides evidence on the overall impact of prices and tobacco control policies on youth smoking, it does not examine the importance of peer influences and, hence, does not allow us to distinguish the direct price/policy effects from the indirect price/policy effects that may operate through the peer effect, referred to as the social multiplier. The contribution of this paper is a combined analysis of the importance of peer effects, price effects and tobacco control policies on the smoking behavior of youths.

A growing body of literature suggests that social interactions may be important determinants of many youth behavioral outcomes. The idea is that the utility that an individual receives from pursuing a given activity depends on the actions of the other individuals in the person's reference or peer group (Manski, 1993, 1995; Becker, 1996; Brock and Durlauf, 2001; Glaeser and Scheinkman, 2001). It is hypothesized that an increase in the prevalence of a given behavior at the peer level may lead to an increased probability of such behavior at the individual level. In this regard, the importance of peer effects has been examined empirically in the context of several behaviors including educational outcomes (Case and Katz, 1991; Borjas, 1994; Aaronson, 1998; Sacerdote, 2000; Kremer and Levy, 2003; Hanushek et al., 2003), crime (Sah, 1991; Glaeser et al., 1996) and teenage pregnancy (Evans et al., 1992; Crane, 1991; Anderson, 1991). A limited number of studies have examined the impact of peer effects on smoking behavior in an econometric framework but have done so without including price and policy measures in their analyses (Norton et al., 1998; Gavia and Raphael, 2001).

This paper contributes to the cigarette demand literature by examining the determinants of smoking among high school students incorporating the importance of peer effects and allowing cigarette prices (taxes) and tobacco control policies to have a direct effect and an indirect effect (via the peer effect) on smoking behavior. In our empirical model, it is important to account for the potential endogeneity of our peer measure in order to provide a causal interpretation of the peer effect on individual youth smoking behavior. The observed correlation between peer effects and individual behavior may be due to the fact that there is correlation in the unobservable characteristics of the individual and his/her peers since parents may self-select themselves into particular areas. That is, families may endogenously sort themselves across neighborhoods or school districts. In our empirical analyses, we use a two-stage generalized least squares estimation model to account for this potential endogeneity. Further, our estimation procedure accounts for the fact that the individual himself can affect the behavior of his peers, while at the same time his peers affect his own behavior.

The paper is structured as follows. Section 2 provides a review of the smoking demand literature and the related peer effects literature. Section 3 describes our model, data and estimation methods. Our results are presented in Section 4. Finally, Section 5 concludes the paper.

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