

Government Policy Towards Smoking: A View from Economics

Jonathan Gruber, Ph.D.*

The past six years have witnessed an enormous change in the treatment of smoking by policymakers. In 1995, federal and state excise taxes on cigarettes were one-third lower, in real terms, than their peak level in the mid-1960s. Since 1995, however, taxes have risen forty percent, or twenty-two cents per pack, and now stand at seventy-eight cents per pack.

From the traditional economics perspective, this shift in government policy is unwarranted. In the standard economics model, fully informed, forward-looking, rational consumers decide whether or not to smoke, weighing the benefits of doing so in terms of smoking enjoyment against the costs in terms of health and other risks. The only call for intervention in such a model are the *externalities* that smokers impose on others, such as increased medical costs for public insurance programs. But such externalities are, in fact, fairly small by most measures, and their costs are offset by the savings from the earlier mortality of smokers, who pay a lifetime of Social Security taxes but often do not live long enough to collect the benefits. As a result, the traditional economics model would suggest that the “optimal” tax on cigarettes may be below the 1995 level.

The traditional model, however, has little evidence in its support. This model is predicated on the description of a smoking decision at odds with laboratory evidence, the behavior of smokers, econometric analysis, and, quite frankly, common sense. Moreover, alternative models, deviating only modestly from this traditional formulation, have radically different implications for government policy, rationalizing large taxes on cigarettes and other types of regulatory controls.

In this Commentary, I describe this “new economics of smoking.” First, I discuss how the new model differs from the old. Second, I offer evidence that supports the evolution in thinking. Finally, I discuss the implications of the new formulation for government policy and the legal arena.

* Jonathan Gruber is a Professor of Economics at the Massachusetts Institute of Technology and the Director of the National Bureau of Economic Research’s Program on Children.

THE TRADITIONAL ECONOMICS MODEL

The traditional economics model of smoking follows the standard economics approach to modeling any decision that involves tradeoffs over time. Smoking a cigarette today increases utility today, but lowers future utility by reducing health. Fully informed, forward-looking, rational consumers trade present gains against future costs, deciding to smoke only if the former outweighs the latter.

Of course, smoking differs from many other activities. It is well established that smoking is a highly addictive behavior. But, Nobel Prize winning economist Gary Becker (and his prominent co-author, Kevin Murphy) showed in the late 1980s that addiction does not, per se, invalidate the conclusions of the standard model, but merely complicates the analysis.¹ The consumer must consider not just the costs and benefits of a given cigarette, but also the fact that smoking a cigarette increases his level of addiction, committing him to future consumption. The underlying principle is the same: individuals will only smoke if the benefits of smoking exceed its costs, including both the monetary and health costs of future cigarettes to which the addicted smoker is committing himself.

This “rational addiction” approach to modeling addictive behaviors appeals to economists and has been adopted, either explicitly or implicitly, as the standard model in the field. The key implication of this approach is that the appropriate role for government (and, by extension, the legal system) is solely a function of the externalities that smokers impose on others. Since the decision to smoke, like all other consumption decisions, is governed by rational choice, the fact that smokers impose enormous costs on themselves is irrelevant. The costs they impose on others, alone, give rise to a mandate for governmental action.

A large amount of literature is devoted to measuring the externalities of smoking. While some controversy exists within this literature, there is a fairly strong consensus that the net externalities are small, on the order of forty cents per pack or less. This seemingly low estimate reflects the convenient fact that smokers die, on average, about six years earlier than non-smokers. Thus, the increased health costs that smokers impose on others, in terms of group insurance and public programs, are offset by their premature death, reducing Social Security benefit payments and Medicare health expenditures. Indeed, some claim that these offsetting savings are so large that smoking actually generates net positive benefits for society.

¹ Gary S. Becker & Kevin M. Murphy, *A Theory of Rational Addiction*, 96 J. POL. ECON. 675-700 (1988).

If the external costs of smoking are small, then the traditional economics model suggests a limited governmental role in regulating smoking. The appropriate level of taxation, or legally induced price increases, is at the level of the externality, which is most likely below or near existing tax levels.

A NEW ECONOMICS APPROACH

However, there is evidence suggesting that the traditional economics model is not appropriate for assessing the role of governments and legal systems in regulating tobacco use. First, the decision to begin smoking is made primarily by youths,² whose ability to make fully informed, appropriately forward-looking decisions is questioned by society in many contexts (as manifest in laws such as minimum drinking, driving, and voting ages). Moreover, my own research convincingly demonstrates that long-term consequences result from deciding to smoke as a youth; simply put, smoking as a youth causes smoking as an adult.³ If youths are not perfectly rational, fully informed, forward-looking decision-makers, then the fact that smoking is addictive does matter, as it causes “mistakes” by youths to have implications throughout their lives. While there is some evidence that youths are fully informed about the health risks of smoking and may even overestimate those risks, it is clear that they dramatically underestimate the addictive nature of smoking. Fifty-six percent of high school seniors who smoke say they will quit within five years, but only thirty-one percent actually do. Moreover, for smokers who average at least one pack of cigarettes per day, the smoking rate five years later among those who stated that they would not be smoking (seventy-four percent) is actually higher than the smoking rate among those who stated that they would still be smoking (seventy-two percent). Such self-delusion can lead to mistakes with lifelong implications. Indeed, I estimate that the dramatic rise in smoking among youths in the 1990s will, given the health damage of smoking, result in 3.2 million fewer years of life for high school seniors surveyed in that period.⁴

Further, there is evidence that adults are unable to quit smoking even if they desire to do so. According to one study, over eighty percent of smokers try to quit in a typical year, the average smoker trying to quit every eight and one-half months. However, fifty-four percent of serious attempts

² More than seventy-five percent of smokers start before age nineteen.

³ Jonathan Gruber, *Youth Smoking in the 1990s: Why Did It Rise and What Are the Long-Run Implications?*, AM. ECON. REV., May 2001, at 85-90.

⁴ *Id.* at 90.

to quit fail within the first week.

These facts have motivated Botond Koszegi and me to develop an alternative formulation of smoking that changes the traditional formulation in just one critical way: it allows smokers to be time-inconsistent.⁵ This approach, now widely used within the new field of "behavioral economics," is one in which there is conflict between what the smoker would like for himself today and what he would like for himself tomorrow.⁶ Today's "self" is impatient: faced with the tradeoff between the short-term pleasures of smoking and the long-term health damages it creates, he will greatly discount the latter and decide to smoke. Tomorrow's "self," however, is considerably more patient and would prefer to quit smoking. Unfortunately, tomorrow never comes. With each new day, the future self that was once patient is now the impatient current self. So, the smoker continues to smoke, to his long-term detriment.

The time-inconsistent formulation of preferences is supported by the extensive literature on individual choice over time. The hallmark of time inconsistency is that individuals will have different levels of patience when making decisions over different timeframes. In the time-consistent case, a tradeoff between any pair of days is the same regardless of when that pair of days arises; impatience between one day and the next is the same now as it is in ten years. But, experiments consistently show that this is not the case; when making decisions about the future, consumers are more patient than when they make those same decisions about today. Individuals are considerably more willing to declare that their diets will start tomorrow than to actually start their diets today. The problem is that when tomorrow comes, pushing back the diet's start date is too easy. Therein lies the conflict: one would always like to start the diet tomorrow, but one never reaches a point of actually making that sacrifice.

The key implication of time-inconsistent preferences is that one's future self would like to somehow constrain one's current self to behave more patiently. Thus, time-inconsistent consumers will demand commitment devices that can induce behavior that is more appropriate in the present. Indeed, the search for such commitment devices is the hallmark of most recommended strategies for quitting smoking. People regularly set up socially managed incentives to refrain from smoking by betting with others, telling others about their decision, or otherwise

⁵ JONATHAN GRUBER & BOTOND KOSZEGI, A THEORY OF GOVERNMENT REGULATION OF ADDICTIVE BADS: OPTIMAL TAX LEVELS (Nat'l Bureau of Econ. Research, Working Paper No. 8777, 2002).

⁶ The traditional economics model assumes that today's self and all future selves agree on the advisability of smoking, leading to no regret or inability to carry out plans to quit.

making it embarrassing to smoke. Both academic publications and self-help books recommend various punishment and self-control strategies. Clearly, smokers need commitment devices to help them overcome their addiction problems.

Unfortunately, the private market imperfectly provides such self-control devices. For every possible device, another device can undo it. A person can always cheat on his bets with others, or not go to support-group meetings and smoke instead. There is no way to truly commit oneself to eschew smoking, or not buy cigarettes, through the private market.

The government, on the other hand, can provide an excellent commitment device—cigarette taxation. By raising the price of cigarettes, smoking becomes more costly for today's self, which would lower today's smoking and thus help achieve what the long-term self would desire. There is extensive literature documenting that smoking falls as cigarette prices rise. The best estimates suggest that each ten-percent rise in cigarette price lowers consumption by five to six percent. For youths, price sensitivity is even higher.

Thus, the time-inconsistent formulation suggests a new rationale for government intervention beyond the damage that smokers inflict on others. In this model, the damage that smokers cause to themselves is also relevant. This is because, from their own long-term perspective, smokers are smoking too much. Their long-term selves recognize this failure and would like to reduce smoking, but, without a legal commitment device, their current selves are unable to do so. Thus, the government can do what the private sector cannot—make smoking more costly in a way that cannot be evaded, thereby combating one's short-term impatience on behalf of one's long-term interests.

It is important to highlight that the new formulation does not depart radically from the traditional economics model. I continue to assume that consumers are perfectly rational, forward-looking, and fully informed. In every respect but one (time consistency), I retain the features of decision-making that economists have used for years to model behavior. However, the two models do have one key difference in their predictions. Under the traditional formulation, higher taxes on cigarettes make smokers worse off; the government would be constraining their rational choice. In contrast, under the alternative formulation, higher taxes make smokers better off; the government would help them achieve the self-control that they cannot secure through the private market. In a recent study, Sendhil Mullainathan and I directly tested this prediction by assessing whether the self-reported

well being of smokers falls or rises when cigarette taxes increase.⁷ Data from both the United States and Canada consistently associated higher taxes with higher levels of reported well being. While the study is not an ideal experimental evaluation of the alternative models, its findings are much more consistent with the time-inconsistent formulation than with the traditional model.

IMPLICATIONS OF THE NEW APPROACH FOR GOVERNMENT POLICY

While the new smoking model changes the traditional model in only one way, it has dramatic implications for public policy. The reason is simple; while the net damage that smokers do to others is small, the damage that smokers do to themselves is enormous. Smoking has many negative health effects, but Koszegi and I focus on only one—the cost in terms of shortened lives.⁸ As mentioned, smokers, on average, live about six years less than non-smokers. Economists, most notably Kip Viscusi, have spent years showing how we can use our revealed risk preferences to value lost life. Viscusi's central estimates, derived from such examples as the higher pay required by workers in risky jobs, suggest that the value of a life is something on the order of seven million dollars.⁹

Based on the average number of cigarettes smoked over the course of a smoker's life, the reduction of years lived, and the value of life-years lost, Koszegi and I compute that the cost of smoking one pack of cigarettes, in terms of the value of life lost, is thirty-five dollars per pack.¹⁰ This is an enormous figure, approximately one hundred times the typical estimate of the externalities caused by smoking. Given the extent to which smokers damage themselves by smoking, any model proposing that some of these internalities be reflected in government policy will suggest very large optimal taxes on cigarettes.

Koszegi and I computed the implications of these internalities under the time-inconsistent model. We first considered a very modest degree of time inconsistency, far below those in most laboratory experiments.¹¹ Even in that case, we found that the optimal tax on cigarettes, above and beyond

⁷ JONATHAN GRUBER & SENDHIL MULLAINATHAN, DO CIGARETTE TAXES MAKE SMOKERS HAPPIER? (Nat'l Bureau of Econ. Research, Working Paper No. 8872, 2002).

⁸ Gruber & Koszegi, *supra* note 5.

⁹ Kip W. Viscusi, *The Value of Risks to Life and Health*, 31 J. ECON. LIT. 1912, 1930 (1993).

¹⁰ This estimate is derived by using estimates for the typical value of (1) a life-year, as determined by Viscusi, *id.* at 1920-24, and (2) the minutes of life lost per cigarette smoked, MANNING ET AL., *THE COSTS OF POOR HEALTH HABITS* 8-9, 62 (Harvard Univ. Press 1989). This is clearly an average and not a marginal calculation.

¹¹ Gruber & Koszegi, *supra* note 5.

any external effects, is one to two dollars. For more severe time inconsistency, which is consistent with laboratory evidence on preferences, the tax is much higher, from five to ten dollars per pack. This estimate does not even incorporate the types of misperceptions held by youths, which might make the tax even higher. Thus, the new smoking model suggests a much more aggressive role for government regulation than does the traditional model.

Another common argument against cigarette taxation is made on distributional grounds. Smoking in the United States is concentrated socio-economically, with the smoking rates of the lowest income quartile roughly twice those of the highest quartile. Expenditures on tobacco products, as a share of family income, falls from 3.2 percent in the bottom income quintile to only 0.4 percent in the top income quintile. This inverse relationship raises the concern that increased cigarette taxes will excessively burden those with the lowest incomes.

The alternative approach to modeling smoking challenges the standard perception that cigarette taxes are highly regressive because cigarette taxes confer greater benefit in terms of “self-control” to consumers who are most price-sensitive. Lower-income groups are much more price-sensitive than higher-income groups. Indeed, my own estimates suggest that the price elasticity of cigarette demand in the bottom quartile of the income distribution is roughly negative one. In other words, when cigarette prices rise, there is no net increase in cigarette spending for the lowest income group. For higher-income groups, price sensitivity is only about one-third that of their lower-income counterparts.

Given these differences, cigarette taxes are, in general, not very regressive since the greater self-control benefits for lower-income groups compensate for the higher taxes they pay as a share of income.¹² Indeed, if self-control problems are great, then cigarette taxes can be highly progressive under the time-inconsistent approach. With a price elasticity of negative one, the poor, as a group, spend no more of their incomes on cigarettes after tax increases than they did before. The savings among those who smoke less offsets the higher spending among those who still smoke the same amount. But, as a group, the poor are much healthier because of the reduction in smoking. So, overall, they are better off from the higher prices.

Thus, the time-inconsistent model overturns the two main arguments against cigarette taxation: (1) that the externalities are small (the alternative model suggests that internalities should matter as well), and (2)

¹² Gruber & Koszegi, *supra* note 5.

that cigarette taxes are regressive (since the self-control value of price increases makes taxes more progressive).

CONCLUSIONS

There has been much hue and cry about recent increases in taxes on cigarettes, with particular focus on New York City, where higher state taxes combined with a city surtax have pushed the price of cigarettes to seven dollars or more per pack. Under the new economics view I outlined in this Commentary, this is a very sensible price level for cigarettes. Since the government provides the quitting device that individuals cannot find in the private sector, individuals are made better off by such high taxes. And, the fact that the poor quit at a considerably higher rate than the rich means that the poor are particularly better off. Cigarette taxes are progressive when analyzed under the time-inconsistent model.

Obviously, more evidence is needed before one approach is accepted as the "right" formulation for modeling smoking decisions. Yet, it is important to recognize that even economics can move beyond the limitations of standard models to capture, more realistically, the dynamics behind such decisions as smoking. When analysis does move beyond standard limitations, the implications for public policy can be quite radical.