

*Given smokers' future preferences,
lawmakers should raise cigarette taxes.*

Smoking's 'Internalities'

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THE PAST SIX YEARS HAVE SEEN AN enormous change in the treatment of smoking by both policymakers and the legal system. In 1995, federal and state excise taxes on cigarettes were one-third lower, in real terms, than their peak level of the mid-1960s. But taxes rose by 40 percent over the next six years, or 22¢ per pack, and now stand at 78¢ per pack. As of 1995, despite decades of smoking-related lawsuits, the tobacco industry had yet to pay out a penny of damages to smokers. But, by 1998, the industry had signed a settlement committing to over \$250 billion in payments to the states over the next 25 years.

From a traditional economic perspective, the shift in both government policy and the legal system is unwarranted. In the standard economic model, fully informed, forward-looking, rational consumers make the decision over whether 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 is the externalities that smokers impose on others, such as increased medical costs for public insurance programs. But such externalities are fairly small by most measures because the costs are offset by the savings from earlier mortality of smokers who pay a lifetime of Social Security taxes but often do not live long enough to collect their benefits. As a result, the traditional economic model would suggest that the "optimal" tax on cigarettes might be below the 1995 level.

But that model, in fact, has little evidence to recommend it. The model is predicated on a description of the smoking deci-

sion that is at odds with laboratory evidence, the behavior of smokers, econometric analysis, and common sense. Moreover, alternative models that only deviate modestly from the traditional formulation have radically different implications for government policy, rationalizing large taxes on cigarettes and the implementation of other types of regulatory controls.

THE TRADITIONAL ECONOMIC MODEL

The traditional economic model of smoking follows the standard economic approach to modeling any decision that involves tradeoffs over time. Smoking a cigarette today increases utility today, but lowers it in the future through reduced health. Fully informed, forward-looking, rational consumers trade off the present gains against the future costs, and decide to smoke only if the former outweigh the latter.

Of course, smoking is not like many other activities; it is well established that smoking is a highly addictive behavior. But Nobel-prize winning economist Gary Becker (along with his prominent co-author Kevin Murphy) showed in the late 1980s that addiction does not, per se, invalidate the conclusions of the standard model. All addiction does is complicate the analysis. The consumer has to consider not just the costs and benefits of a given cigarette, but also the fact that smoking the cigarette increases his level of addiction, committing him to future consumption. The underlying principle is the same: Individuals will only smoke if the benefits exceed the costs, including both the health costs of that cigarette and the monetary and health costs of all future cigarettes that the addicted smoker is committing himself to.

Externalities The "rational addiction" approach to modeling addictive behaviors was appealing to economists, and it has been adopted, either explicitly or implicitly, as the standard model in our field. The approach's key implication is that the appropriate role for government (and, by extension, the legal

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system) is solely a function of the externalities that smokers impose on others. Because smoking, like all other consumption decisions, is governed by rational choice, the fact that smokers impose enormous costs on themselves is irrelevant; it is only the costs they impose on others that give rise to a mandate for government action.

There is a large literature devoted to measuring the externalities associated with smoking. While some controversy exists within the literature, there is a fairly strong consensus that the externalities that have been measured are small on net, on the order of 40¢ per pack or less. That low-sounding estimate reflects the convenient fact that smokers die about six years earlier on average than non-smokers. Thus, the increased health costs imposed by smokers on others in group insurance and public programs are offset by their premature death, which

reduces the benefit payments made by Social Security and the health expenditures of Medicare. Indeed, some have claimed that the offsetting positive benefits are so large that smoking actually generates net positive benefits for society.

The literature has not focused on some potentially important external effects of smoking, however. One such effect is the health costs of secondhand smoke, arising from increased lung cancer and cardiac disease risk through exposure to the smoking of others. The size of the health costs of secondhand smoke are quite ambiguous and controversial, with some analysts claiming that the costs are 70¢ per pack or more and others claiming that there is no credible evidence for any significant costs. A second issue is the costs from the reduction in infant health from smoking, which is a much less controversial conclusion; those costs, which include both the short-run costs of medical care and long-run costs of special education, may amount to as much as 70¢ per pack.

But, for both of those issues, many economists would question whether there really are externalities. Most of the costs from secondhand smoke, and much of the costs from low birth weight children, are imposed on members of the smoker's family, who should be considered by the smoker in his smoking decision. Thus, the costs are not external to the smoker's family, only to the smoker himself.

If the external costs of smoking are small, then the traditional economic model suggests a limited role for government in regulating the activity. The appropriate level of taxation, or legally induced price increases, would be at the level of the externality, which is most likely below or near existing tax levels. Other issues such as secondhand smoke may justify public policies such as clean air laws that restrict smoking in public places, but the limited evidence on the impacts of secondhand smoke also raises questions about the widespread nature of the restrictions.

A NEW ECONOMIC APPROACH

A variety of evidence, however, suggests that the traditional economic model is not the appropriate one for assessing the role of government and the legal system in regulating tobacco

use. First, the decision to initiate smoking is made primarily by youths, whose ability to make fully informed, appropriately forward-looking decisions is questioned by society in many contexts (e.g., minimum ages for drinking, driving, and voting). More than three-quarters of smokers begin smoking before age 19. Moreover, my own research has shown convincingly that the decisions of youths to initiate smoking have long-run consequences: Smoking as a youth causes smoking as an adult. So, if youths do not meet the conditions of "*homo economicus*," then the fact that smoking is addictive does matter, as it causes "mistakes" by youths that have implications throughout life.

There is some evidence that youths are fully informed about the health risks of smoking, and may even overestimate those risks. But it is also clear that youths dramatically underestimate the addictive nature of smoking. Among high school seniors who smoke, 56 percent say they will not be smoking five years later, but only 31 percent do quit five years hence. Moreover, among those who smoke more than one pack per day, the smoking rate five years later among those who stated that they would not be smoking (74 percent) is actually higher than the smoking rate among those who stated that they would be smoking (72 percent). That type of misinterpretation can lead to mistakes that have lifelong implications. Indeed, I have estimated 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 that cohort of teens.

Second, there is evidence that adults are unable to quit smoking even if they have a desire to do so. Eight in 10 smokers in America express a desire to quit the habit, but many fewer than that actually do quit. According to one study, over 80 percent of smokers try to quit in a typical year, and the average smoker tries to quit every 8.5 months. Fifty-four percent of serious quit attempts fail within one week.

"Internalities" Those facts have motivated me, in work with my coauthor Botond Koszegi, to develop an alternative formulation of the smoking calculus that changes the traditional formulation in just one critical way: by allowing smokers to be time inconsistent. That 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. Today's "self" is impatient. Faced with the tradeoff between the short-term pleasures of smoking and the long-term health damages of doing so, he will greatly discount the latter and decide to smoke. But tomorrow's "self" is much more patient and would prefer to quit smoking. The problem, however, is that tomorrow never comes. The next day, the future self that was patient is now the current self that is impatient. So the smoking continues, to the long-term regret of the smoker.

That is in contrast with the traditional economic model's time-consistent formulation. In that formulation, today's self and all future selves are in agreement about the advisability of smoking, leading to no regret or inability to carry out plans to quit.

The time-inconsistent formulation of preferences is one that is much more widely supported by the large literature on exper-

imental evaluations of individual choice over time. The hallmark of time inconsistency is that individuals will have different levels of patience when making decisions over different time frames. In the time-consistent case, a tradeoff between any pair of days is the same regardless of when that pair of days arises; your impatience between one day and the next is the same now as in 10 years. But experiments consistently show that not to be true; when making decisions about the future, consumers are much more patient than when those same decisions are made about today. Individuals are much more willing to declare that their diets will start tomorrow than to start the diet today. The problem is that when tomorrow comes, it is once again easier to push off the date that the diet will begin. So there is a conflict; you would always like to start the diet tomorrow, but you never get to the point where you are actually willing to make that sacrifice.

Self-control 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 (e.g., to somehow force you today to push away that extra piece of cake). Thus, time-inconsistent consumers will have demand for commitment devices that can be used to induce more appropriate behavior 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 the decision, and otherwise making it embarrassing to smoke. Both academic publications and self-help books recommend various punishment and self-control strategies. That illustrates that the experts on smoking already know what is new in this formulation of smoking: Individuals have self-control problems when it comes to smoking and need commitment devices to overcome the problems.

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

But government or the courts can provide an excellent commitment device: cigarette taxation (or legally-induced price increases). By raising the price of cigarettes, government and the courts can make smoking more costly for today's self, helping achieve what the smoker's own long-term self would desire by lowering smoking today. There is a large literature that documents that smoking falls as cigarette prices rise; the best estimates suggest that each 10-percent rise in the price of cigarettes lowers their consumption by five to six percent. For youth smokers, price sensitivity is even higher. So higher taxes, and therefore higher prices, will significantly reduce smoking today.

Thus, the alternative formulation suggests a new rationale for government and legal intervention beyond the damage that smokers do to others. In the new model, the damage that smokers do to themselves is also relevant. That is because, from their own long-run perspective, smokers are smoking too much.

Their long-term selves recognize that failure and would like to reduce smoking. But, without the help of government or a legal commitment device, their current selves are unable to do so. So government and the legal sectors can do what the private sector cannot; they can make it more costly to smoke in a way that cannot be evaded, combating one's short-term impatience on behalf of one's long-term interests.

This is not a perfect commitment device, of course, because of smuggling and other means of evading cigarette taxation. But most evidence suggests that smuggling is not a major concern at current levels of cigarette taxation in the United States, so higher taxes remain a much better commitment device than anything available in the private market.

It is important to highlight that this is not a radical departure from the traditional economic model. In the new formulation, I continue to assume perfectly rational, forward-looking, fully informed consumers. That is, in every respect but one (time consistency), I retain the features of decision-making that economists have used for modeling behaviors for years. As a result, the alternative model also generates many aspects of real-world behavior that are predicted by the traditional model. For example, under both models, smokers react to higher prices by smoking less.

But the models do have one key differential prediction. Under the traditional formulation, higher taxes on cigarettes make smokers worse off; the government is constraining their choice of an activity that they are pursuing rationally. But, under the alternative formulation, higher taxes on cigarettes make smokers better off; the government is helping them achieve the self-control that they cannot achieve through the private market.

Test In a recent study, Sendhil Mullainathan and I directly tested that prediction. We did so by assessing whether the self-reported well-being of smokers falls or rises when cigarette taxes increase. Using data from both the United States and Canada, we found consistently strong evidence that higher cigarette taxes are associated with higher levels of reported well-being among smokers. While that is not an ideal experimental evaluation of the alternative models, it is a finding that is much more consistent with the alternative formulation of the smoking decision than it is with the traditional model.

GOVERNMENT POLICY

While the new approach to modeling smoking changes the traditional model in only one way, it has dramatic implications for government policy. The reason is a simple one. While the damage that smokers do to others is, on net, small, the damage smokers do to themselves is enormous. There are many negative impacts of smoking on individual health, but Botond Koszegi and I, in jointly conducted research, have focused on only one: the costs in terms of shortened lives. As noted above, on average smokers live about six fewer years than nonsmokers. Economists, most notably Kip Viscusi, have spent years showing how we can use individuals' revealed preferences toward risk to value that type of lost life. His central estimates, derived from such examples as measuring the higher pay

required by workers in risky jobs, suggest that the value of a life is on the order of \$7 million in today's dollars.

Bringing together the reduction in life, the average number of cigarettes smoked over the smoker's life, 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 \$35 per pack. That is an enormous figure, on the order of 100 times the typical estimate of the external damage done by smoking. Given the enormous damage that smokers do to themselves by smoking, any model that suggests some share of the "externalities" should be reflected in government policy will suggest very large optimal taxes on cigarettes.

Koszegi and I show that in our work by considering the alternative formulation described above. We first consider a very modest degree of time inconsistency, much below that assessed by most laboratory experiments. Even in that case, we find the optimal tax on cigarettes, above and beyond any externality effects, is \$1 to \$2. For more severe time inconsistency, which is consistent with laboratory evidence on preferences, the tax is much higher — on the order of \$5 to \$10 per pack. And that does not even incorporate the types of misperceptions held by youth, which might make the tax even higher. Thus, the alternative model suggests a much more aggressive role for government regulation than does the traditional model.

Elasticity Another common argument against cigarette taxation is on distributional grounds. Smoking in the United States is very socioeconomically concentrated. The smoking rates of the lowest income quartile are roughly twice those of the highest quartile. Expenditures on tobacco products as a share of family income fall from 3.2 percent in the bottom income quintile to only 0.4 percent in the top income quintile. That pattern raises a concern that increased cigarette taxes will be excessively burdensome on those with the lowest incomes.

But the alternative approach to modeling smoking also challenges the standard perception that cigarette taxes are highly regressive. For groups that are particularly price sensitive, higher pricing is an effective self-control device because it will have more of the desired effect of reducing their smoking. And 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 income distribution is roughly minus one; that is, when cigarette prices rise, there is no net increase in cigarette spending for the lowest income group. For higher income groups, the price sensitivity is only about one-third as large.

Koszegi and I show that, given the differences, cigarette taxes are in general not very regressive because the larger self-control benefits for lower income groups compensate for the higher taxes they pay as a share of income. Indeed, if self-control problems are large, then cigarette taxes can be highly progressive under the alternative approach. The point is that, with a price elasticity of minus one, the poor, as a group, spend no more of their incomes on cigarettes after tax increases than they did before; the higher spending among those who still smoke is offset by the savings among those who quit. But, as a group, the poor are much healthier as a result of the fact that

they have reduced their smoking. So, on net, they are better off from the higher prices.

Thus, the alternative time-inconsistent model overturns the two main arguments against cigarette taxation: that the externalities are small (because it suggests that “internalities” should matter as well), and that cigarette taxes are regressive (because the self-control value of such taxes makes taxes more progressive). The alternative model also suggests a rationale for the other major government intervention to regulate smoking: clean air regulations that limit smoking in public places. As noted above, the weak evidence on the health impacts of secondhand smoke provides only a limited rationale for the policies. But they can also serve as self-control devices, making it more costly to smoke by limiting the places in which smokers can engage in the activity. Indeed, recent evidence suggests that workplace-smoking bans reduce the smoking of workers at firms that implement them. Thus, such policies may be part of an appropriate portfolio of government policies to combat self-control problems among smokers.

THE LEGAL SYSTEM

In the latter half of the 1990s, the major source of intervention against smoking was not state or federal governments, but the tort system. There is a long history of suing the tobacco industry for causing harm to health, but, before the mid-1990s, the tobacco industry had yet to pay any damages to smokers. The tide began to turn in 1994, however, as the first class-action lawsuit was filed against the industry in *Castano et al. v. The American Tobacco Company*. Sixty-five law firms pooled their resources to file the case, which alleged that the tobacco industry had failed to warn adequately about the addictive properties of cigarettes. Despite the Fifth Circuit Court of Appeals’ 1996 ruling that the suit was too unwieldy, it set the stage for more state lawsuits to follow.

Tobacco settlement In March of 1994, the state of Mississippi filed a lawsuit against the industry to recover the costs to the state of treating smoking-related illnesses under its Medicaid program. The lawsuit posed two particular problems for the industry. First, it relied on the argument that the industry was liable to the state for medical costs, even if smokers knowingly contributed to their illness. Second, it was filed shortly after the passage of Florida’s Medicaid Third-Party Liability Act of 1994 (and the consideration of similar legislation in other states), which allowed the state to sue a manufacturer of an allegedly harmful product for the medical expenses of a group, relying on statistical evidence instead of proving causation and damages in each case. In the wake of the Mississippi suit, most other states filed similar suits for Medicaid cost recovery against the industry. In addition, in early 1996, the largest “fringe” manufacturer, Liggett, broke ranks with the major industry participants to settle with five states, in the process providing a host of secret documents that detailed industry knowledge of the damages of smoking and marketing to youth that provided further ammunition for additional cases. The legal risks from state and private class-action suits were an enormous drag on the market value of the industry.

In the face of enormous legal risk, the tobacco industry in early 1997 sat down with the attorneys general of the states filing lawsuits and the lawyers behind the *Castano* class-action suit to hammer out a comprehensive agreement to limit their legal liability. In April 1997, a proposed settlement was announced. The key components were that the industry would agree to pay \$368 billion over 25 years to the states in return for settlement of the state suits, immunity from future punitive damages as part of individual suits, and immunity from future class-action suits. In effect, the settlement was akin to the industry buying legal insurance. The price paid by the industry for the insurance was fairly modest, because a key component of the payments was a “volume adjustment” that would tie each company’s payment to its volume of cigarette sales, essentially converting the settlement into a tax (with the exception of a \$10 billion up-front payment that could be passed forward to prices, as was explicitly mandated in the agreement). Thus, in essence, the states, the private attorneys, and the industry privately negotiated a tax increase in return for legal protections for the industry.

While the attorneys general did have the right to settle their state lawsuits, an act of Congress was required to grant the other legal immunities to the industry. In September of 1997, the Clinton administration announced that it was not satisfied with the parameters of the tobacco deal and would not endorse legislation to implement it. The following spring, the Clinton administration worked with Sen. John McCain (R-Ariz.) and others to develop a legislative alternative to the settlement that was both more stringent (with larger payments and stronger FDA regulation) and provided less legal protection. The industry immediately announced its opposition to the tougher deal, and the opposition increased as the legal protections were stripped out during congressional debate. Ultimately, the legislation died in June of 1998.

The tobacco industry then went back to the negotiating table with the states and hammered out a much more limited settlement in November of 1998. Under the Master Settlement Agreement (MSA) and the existing settlements with four states, the industry would make \$246 billion in volume-adjusted payments to the states over 25 years, or roughly 45¢ per pack. The MSA also included some voluntary advertising restrictions, such as the removal of billboard advertisements for cigarettes and a ban on using cartoon characters in advertisements.

The new tax Thus, the existing settlements can be summarized as taxes on smokers that are imposed through the tort system rather than through the government. In that sense, we can broadly speak of both government taxation and tort interventions as mechanisms to raise the price of cigarettes. That raises two questions: Are prices rising “too much” through the combined mechanisms? And, what is the right combination to use to raise prices?

Since the end of 1996, the price of a pack of cigarettes, on average around the country, has risen from \$1.85 to \$3.37. Twenty-one cents, or one-seventh, of the increase is because of taxes; the remaining price increase is due largely to industry reaction to its legal woes. If we consider the pre-1997 price

net of taxes as the “true” underlying price of cigarettes and adjust for normal annual cigarette price increases, then the combined tax plus legal costs now stands at \$1.85. That figure is towards the lower end of the optimal tax range estimated in my work with Koszegi. So, under the alternative model, the price increase over the last few years has not been “too large.”

But the combination of government policy and legal remedies is not necessarily the right one. In theory, the tort system is a less appropriate medium for regulating smoking than is legislative action. The outcomes reflect the views of a small number of nonelected officials (judges or juries) rather than the preferences of society at large. And a large share of the proceeds may go to lawyers who facilitate the settlements rather than to the taxpaying public at large. Under the MSA, lawyers representing the 46 settling states received \$1.25 billion initially and \$500 million per year thereafter. The enormous payments appear disproportionate to the actual work done by lawyers in many states, some of whom had not even filed cases before the MSA was signed. Indeed, the economist Jeremy Bulow has estimated that lawyer fees based on the actual damage payments would have been about $\frac{1}{40}$ of the actual payments that the tobacco lawyers are scheduled to receive.

At the same time, it is not clear that the relevant comparison is between a tax imposed through the legal system and a tax imposed through the legislative system. It is important to recall that, before the spate of legal action, cigarette taxes had been steadily declining in real terms. In the political environment of the mid-1990s, the likely alternative to a settlement was not a 45¢-per-pack federal tax, but rather no government action to raise the price of cigarettes. Despite public opinion polls strongly favoring higher taxes on cigarettes, the tobacco industry had been successful for years in combating those taxes. The legislative system may not have been serving the public interest in terms of regulating smoking in any better manner than the legal system.

Thus, in the language of economics, the settlements of the late 1990s may have been a “second-best” means of achieving a desired rise in the price of cigarettes. In that sense, the payments to lawyers, while inequitable, could be viewed as the political economy costs that must be paid to impose cigarette taxes. If cigarette prices are too low, as the new model I described above suggests, then the inequities may be a reasonable cost to pay for the ultimate outcome achieved.

WHERE TO FROM HERE?

The dramatic increase in the prices of cigarettes in the United States over the past five years has been driven primarily by reactions to legal settlements and ongoing legal risks. But any barriers to public sector regulation of the tobacco industry appear to have been broken in recent months with a spate of very large state excise tax increases.

The recent political acceptability of excise taxes implies that there is an ever-weakening case for the tort system as a means of regulating tobacco prices. That suggests that the time may be ripe to revisit the type of “comprehensive settlement” discussed in 1998. A mutually acceptable deal between government regulators and tobacco companies might emerge around

some mix of settlement payments and limited protection from lawsuits. For example, the government could mandate a cap on punitive damages that would provide some protection without altogether eliminating the possibility of future lawsuits that smokers might bring. In return, the government could receive settlement payments and perhaps the right for the Food and Drug Administration to regulate tobacco products; the settlement payments could be used to finance smoking cessation and youth smoking interventions. But any such compromise solution would best be approached through an expert non-partisan or bipartisan commission that could debate the issues at arms length, away from the political pressures that beset Congress when it attempts to discuss the issue.

Whatever the next steps, the new framework laid out in this article suggests that we must remove our traditional economic blinders in assessing the appropriate regulatory role for government in this arena. The alternative model described here may not be the right one, but it has much more to recommend it than the standard model that has been used to date. The weaknesses of the traditional model, and the enormous costs of smoking to individuals, suggest that government should play a larger role in regulating smoking in the United States than is suggested by the external costs of smoking alone. **R**

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