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# CONSTRUCTIVE CIGARETTE REGULATION

W. KIP VISCUSI†

*Professor W. Kip Viscusi argues for a move away from the adversarial approach to tobacco regulation, an approach that is currently embodied in class action lawsuits and the proposed broadening of FDA regulatory power over cigarettes. In this Article, he suggests that the FDA should take a constructive role in fostering technological innovations to promote cigarette safety, in much the same way that the government currently fosters safety improvements in motor vehicles and jobs. Professor Viscusi claims that the objective of government policy should be to promote informed consumer risk taking—an approach which recognizes that adult consumers have a right to smoke and to incur the associated risks. He provides survey data demonstrating that although consumers know that smoking is a risky decision, they have little exposure to information regarding the comparative riskiness of various cigarette brands.*

*According to Professor Viscusi, the government should assist in compiling and disseminating information regarding the comparative risks of different smoking options and the effects of certain innovative safety features for cigarettes. Making this information available would enable consumers to make more informed smoking decisions and potentially minimize the health hazards that smoking poses.*

## INTRODUCTION

For over three decades, cigarettes have been the subject of substantial federal regulation. Mandatory hazard warnings,<sup>1</sup> restrictions

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† John F. Cogan, Jr. Professor of Law and Economics and Director of the Program on Empirical Legal Studies, Harvard Law School. Professor Viscusi presents the arguments he first made on March 6, 1998, at the *Duke Law Journal's* 1998 Administrative Law Conference.

1. See *infra* text accompanying notes 36-38 & tbl.1 (discussing the evolution of federal legislation requiring cigarette warning labels); cf. Comprehensive Smokeless Tobacco Health Education Act of 1986, Pub. L. No. 99-252, 100 Stat. 30 (codified at 15 U.S.C. §§ 4401-4408 (1994)) (requiring warning labels and ingredient disclosure on smokeless tobacco products and establishing a public health education program to increase risk awareness).

on advertising,<sup>2</sup> limitations on sales to minors,<sup>3</sup> and public smoking restrictions<sup>4</sup> are among the most significant forms of cigarette regulation. In addition, cigarettes are subject to considerable federal and state excise taxes, which averaged fifty-six cents per pack in the year ending June 30, 1997.<sup>5</sup> These taxes serve to discourage the purchase of cigarettes,<sup>6</sup> and to shift more than thirteen billion dollars annually from smokers to the rest of society.<sup>7</sup>

Recent developments in the national smoking debate herald the emergence of a more aggressive regulatory regime. The Food and Drug Administration (FDA) will likely play a primary role in this new regime. As Cass Sunstein and Richard Merrill discuss in articles in this symposium,<sup>8</sup> if the FDA's recent assertion of jurisdiction over cigarettes is upheld, it will mean a much more stringent regulatory era for cigarettes. Moreover, tobacco legislation now being considered by Congress presents a substantial prospect for more aggressive federal regulation. The "Proposed Resolution" that emerged in 1997 as a result of the negotiations between the cigarette industry and the State Attorneys General<sup>9</sup> is intended to be a framework for congressional legislation.<sup>10</sup> The Proposed Resolution includes a greatly ex-

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2. See, e.g., 15 U.S.C. § 1335 (1994) (making it "unlawful to advertise cigarettes and little cigars on any medium of electronic communication subject to the jurisdiction of the Federal Communications Commission").

3. See Alcohol, Drug Abuse, and Mental Health Reorganization Act of 1992, Pub. L. No. 102-321, § 202, 106 Stat. 323, 394-95 (1992) (codified at 42 U.S.C. § 300x-26 (1994)) (requiring states to prohibit the sale of tobacco products to individuals under age eighteen in order to receive federal mental health funds under the act).

4. See, e.g., 49 U.S.C. § 41706 (1994) (prohibiting smoking in the passenger cabin of domestic airline flights).

5. See THE TOBACCO INSTITUTE, *THE TAX BURDEN ON TOBACCO* viii (1997). This figure represents the sum of the federal tax for fiscal year 1997 (\$0.24) and the average state tax for the year ending June 30, 1997 (\$0.32). See *id.*

6. Taxes on cigarettes raise the price consumers must pay. Higher prices will discourage cigarette smoking if the demand for cigarettes is a decreasing function of the price. For evidence of the negative price elasticity of demand for cigarettes, see W. KIP VISCUSI, *SMOKING: MAKING THE RISKY DECISION* 102-05 (1992) [hereinafter VISCUSI, *SMOKING*].

7. See THE TOBACCO INSTITUTE, *supra* note 5, at vii.

8. Cass R. Sunstein, *Is Tobacco a Drug? Administrative Agencies as Common Law Courts*, 48 DUKE L.J. 1013 (1998); Richard A. Merrill, *FDA's Attempt to Regulate Tobacco Products: Audacious and Anomalous*, 48 DUKE L.J. 1071 (1998).

9. For text of the Proposed Resolution, see Campaign for Tobacco-Free Kids, *Settlement Document* (visited Apr. 19, 1998) <[http://www.tobaccofreekids.org/html/settlement\\_document.html](http://www.tobaccofreekids.org/html/settlement_document.html)> [hereinafter Proposed Resolution].

10. On April 8, 1998, the major tobacco companies, led by R.J. Reynolds, withdrew from the negotiations. See David E. Rosenbaum, *Cigarette Makers Quit Negotiations on Tobacco Bill*, N.Y. TIMES, Apr. 9, 1998, at A1. Although no bill embodying the Proposed Regulation has

panded role for the FDA. Since this expanded role would be enacted through new legislation rather than through interpretation of existing legislation, Professor Merrill and Sunstein's debate about the statutory basis for an expanded FDA role would no longer be pertinent if such sweeping legislation is passed.<sup>11</sup>

Included among the many FDA provisions in the Resolution are the following:

- The FDA's authority to regulate tobacco products under the Food, Drug and Cosmetic Act would be confirmed.<sup>12</sup>
- The FDA would be given the authority to regulate the levels of nicotine in tobacco products.<sup>13</sup>
- The FDA would be given the authority to restrict tobacco advertising to media it specifies.<sup>14</sup>
- All claims regarding "light" or "low-tar" cigarettes would have to be accompanied by a disclaimer submitted to the FDA for approval.<sup>15</sup>
- The FDA would be required to issue rules pertaining to the "testing, reporting and disclosure of tobacco smoke constituents . . . including, but not limited to 'tar,' nicotine and carbon monoxide."<sup>16</sup>

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yet been introduced in Congress, the Proposed Regulation does bear some similarities to proposed legislation, such as the Universal Tobacco Settlement Act, S. 1415, 105th Cong. (1997). This bill, introduced by Senator McCain, would impose a much higher cost burden on the cigarette industry and would not give the tobacco companies immunity from lawsuits, but it does include similar provisions regarding warnings and the role of the FDA. *See id.* § 111, 142; *see also* Rosenbaum, *supra* (comparing major provisions of McCain Bill and the June Settlement). The tobacco companies that negotiated the Proposed Resolution have stated their "unequivocal" opposition to the McCain bill. *See McCain Vows to Keep Pushing Tough Tobacco Bill*, N.Y. TIMES, Apr. 3, 1998, at A24. The Senate Commerce Committee approved the McCain bill with strong bipartisan support. *See Rosenbaum, supra.*

11. *See* Merrill, *supra* note 8; Sunstein, *supra* note 8.

12. *See* Proposed Resolution, *supra* note 9, at 2.

13. *See id.* at 3.

14. *See id.* at 8.

15. *See id.* at 9.

16. *Id.* at 11.

- The FDA would have to approve all health claims for lower risk tobacco products.<sup>17</sup>
- The FDA could issue performance standards for cigarettes including specifying a reduction in nicotine yields.<sup>18</sup>

These provisions, and those in other possible legislative resolutions of the tobacco litigation, would clearly create a prominent role for the FDA in regulation of the cigarette industry. While the proposal has not yet been adopted by Congress, many of its specific components could be incorporated into future legislation and are indicative of the kinds of regulatory initiatives that might have broad support. Thus, the main question is not whether there will be extensive FDA regulation of cigarettes, but, rather, what form such regulation should take.

The government may regulate risky products in several ways. First, the government may regulate the flow of information regarding a product—either by providing hazard warnings or by restricting advertising. Hazard warnings are required for a wide range of products—from lawn mowers to prescription drugs—and have been one of the primary ways that the government has regulated cigarettes. While the content of these warning labels has changed over the past several decades, the government has continually required that some type of warning be included on cigarette packaging and in cigarette advertising.<sup>19</sup> Prohibition of cigarette ads on television or near schoolyards is also a form of informational regulation since it limits what information the industry can provide through various media.

A second form of regulation is alteration of the character of the product itself. Health and safety standard regulations mandate various kinds of safety improvements. For example, regulatory agencies have specified the height and dimensions of handrails,<sup>20</sup> mandated the installation of seatbelts and airbags in cars,<sup>21</sup> and even established

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17. *See id.* at 14.

18. *See id.* at 15.

19. Cigarette warning labels were first required with the passage of the Federal Cigarette Labeling and Advertising Act of 1965, Pub. L. No. 89-92, 79 Stat. 282 (codified as amended at 15 U.S.C. §§ 1331-1340 (1994)). Since that time, the federal government has twice altered the content of these warnings by statute. *See infra* text accompanying notes 36-38 & tbl. 1.

20. *See, e.g.*, 29 C.F.R. § 1910.29(f)(4) (1997) (prescribing handrail requirements for mobile ladder stands).

21. *See* 49 C.F.R. § 571.208 (1997).

flammability standards for children's pajamas.<sup>22</sup> In contrast, the government has never subjected cigarettes to similar kinds of technological requirements aimed at promoting safety. There has been, for example, no effort to require filters on cigarettes or even to identify, apart from tar and nicotine information, which cigarettes are safer. Indeed, the government has inexplicably discouraged safety improvements for cigarettes.<sup>23</sup>

The most extreme form of regulation is a total ban on the product. Currently, twenty-five percent of the adult population in the United States continues to smoke.<sup>24</sup> Although it is feasible to limit the age at which people can buy cigarettes and the kinds of cigarettes that are sold, it seems unlikely that a complete ban would be fully effective.<sup>25</sup> Moreover, even anti-smoking activists have not claimed that the market failure is so great that a complete ban is necessary. There have been calls for an end to smoking, but there has been no major effort to achieve this outcome through a ban.

For over three decades, the government has mandated warnings on cigarette packages, restricted cigarette advertising, and undertaken a variety of public information campaigns to educate the public about the general risks of smoking. As the data I present in Part II indicates, this mission of informing the public has largely been accomplished. These health risks of smoking are almost universally understood.

What is needed now is a regulatory effort that goes beyond simple warning messages and promotes cigarette safety in the same way that the government fosters the safety of various other products. Rather than stimulating safety innovations, the FDA has taken an adversarial position and discouraged the promotion of safer cigarettes, focusing instead on eliminating smoking behavior. This Article advocates a regulatory policy shift, contending that the government should undertake two new kinds of policies to promote greater safety in cigarettes, in much the same way that the government fosters greater safety in motor vehicles and in the workplace.

22. See 16 C.F.R. § 1615.3 (1998).

23. See *infra* notes 80-82 and accompanying text.

24. See U.S. DEP'T OF COMMERCE, STATISTICAL ABSTRACT OF THE UNITED STATES 145 (117th ed. 1997).

25. As the paper in this Symposium by Joni Hersch indicates, even age restrictions on cigarette purchases may not be fully effective. See Joni Hersch, *Teen Smoking Behavior and the Regulatory Environment*, 47 DUKE L.J. 1140, 1151-55 (1998).

First, as I discuss in Part III, the government should develop a comprehensive rating system that indicates the hazards associated with different cigarettes in order to assist consumers in matching cigarette characteristics with their risk preferences. Such an aggressive comparative risk information policy would exploit the market forces reflected in the greatest shift in smoking behavior in the past half century—the decrease in the average tar level of cigarettes.<sup>26</sup> Consumer demand for safer cigarette products is substantial,<sup>27</sup> and the government should develop a safety rating system that would inform consumers of risk characteristics of cigarettes in a manner that goes beyond the current tar and nicotine ratings.

Second, as I discuss in Part IV, the government should encourage technological advancements in cigarette design that reduce either the health hazards of cigarettes or their nicotine content. These technological advancements may be quite radical and may substantially change the character of the cigarette—as the Premier cigarette, developed by R.J. Reynolds, indicates.<sup>28</sup> Manipulating product character through safety devices is a well-established regulatory approach. Of course, questions remain regarding the safety of these advances compared to currently marketed cigarettes. The FDA could assume a leadership role by encouraging advancements in cigarette safety, by rating the comparative riskiness of products that reflect these new safer designs, and by promoting, rather than discouraging, consumer purchase of such safer cigarettes.

Underlying this regulatory proposal is a general assumption that the objective of government policy should be to promote informed consumer risk-taking. A move to this constructive approach would require that the FDA abandon its current anti-industry stance. Informed choice requires that consumers understand not only the overall hazardousness of smoking, but also the relative risks of different smoking choices. Promotion of informed choice recognizes that adult consumers have a right to smoke and to incur the associated risks. Expanding the range of consumer choice by encouraging the introduction of safer cigarette designs would be consistent with the appro-

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26. See *infra* text accompanying notes 76-80 (discussing the great "Tar Derby") and Figure 1.

27. This demand for safe cigarettes is reflected in the dramatic decline in the tar levels of cigarettes, as compared to trends in per capita consumption of cigarettes overall. See VISCUSI, *SMOKING*, *supra* note 6, at 63 n.37.

28. See *infra* notes 101-109 and accompanying text.



prate recognition of consumers' rights to make product choices that are reflective of their preferences.

### I. WHY REGULATE TOBACCO?

By any standard, cigarettes are a very risky product. The estimated incremental lifetime mortality risk associated with smoking is between one-sixth and one-third.<sup>29</sup> Even though the loss in life expectancy is considerably less than for acute accidents that lead to premature loss of life,<sup>30</sup> the risks associated with smoking are quite large. By contrast, the annual probability of being killed as a result of a work-related injury averages under 1/10,000 in the United States.<sup>31</sup> Even if one assumes a thirty-year work life, this lifetime job risk is under 1/300, or one hundred times smaller than the upper bound estimate of the lifetime risk associated with smoking. Similarly, compare the risk level currently used by the U.S. Environmental Protection Agency in determining whether to clean up hazardous waste sites. Cleanup of a site is mandated when the individual lifetime cancer risk reaches 1/10,000.<sup>32</sup> Cleanup is discretionary for risks of between 1/10,000 and 1/1,000,000.<sup>33</sup> Risks of this magnitude are significantly smaller than those posed by cigarette smoking.

The mere existence of a large risk, however, is not a legitimate rationale for government regulation. If the risk is taken voluntarily, those who incur the risk presumably are receiving some compensating benefit, whether it be in the higher wages of a risky job or in the pleasure of cigarette smoking.<sup>34</sup> In a world of rational choice, with full

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29. See VISCUSI, SMOKING, *supra* note 6, at 80.

30. The life years lost for various accidents vary depending upon the age of the victim. Firearms accidents lead to an average loss of almost 46 life years, drownings lead to a loss of 43 years, and accidents overall lead to a total life year loss of 29 years. See W. Kip Viscusi et al., *Measures of Mortality Risks*, 14 J. RISK & UNCERTAINTY 213, 220 (1997).

31. See VISCUSI, SMOKING, *supra* note 6, at 24.

32. The risk cutoffs for cleanup are specified in internal EPA documents. See Office of Solid Waste and Emergency Response, U.S. Envtl. Protection Agency, OSWER Directive No. 9355.0-30, Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions (1991). For a discussion of these cutoffs, see James T. Hamilton & W. Kip Viscusi, *How Costly is "Clean"? An Analysis of the Benefits and Costs of Superfund Site Remediations*, 18 J. POL'Y ANALYSIS & MGMT. (forthcoming March 1999). For an extensive discussion of the Superfund cleanup program, see W. Kip Viscusi & James T. Hamilton, *Cleaning up Superfund*, PUB. INTEREST, Summer 1996, at 52, 52-60 [hereinafter Viscusi & Hamilton, *Cleaning up Superfund*].

33. See Viscusi & Hamilton, *Cleaning up Superfund*, *supra* note 32, at 55.

34. This is the classic theory of compensating differentials. See ADAM SMITH, THE WEALTH OF NATIONS 112 (Edwin Cannan ed., 1937) (1776). Smith observes: "First, The wages

information, there would be no rationale, from the standpoint of improving individual welfare, for interfering with these decisions. Thus, the key question with respect to regulating smoking behavior as it affects smokers' health is whether a person's decision to smoke is itself made with adequate information about smoking. This focus is consistent with the usual economic approach for goods traded in markets—consumer error and lack of information should be the key triggers of potential intervention.<sup>35</sup>

A major theme of this Article is that assessing the adequacy of consumer information involves much more than simply asking whether consumers are aware that smoking is risky. Even if there is widespread knowledge of the health risks of smoking, there may be, nevertheless, a constructive role for government action. A *general* awareness of the hazards of smoking does not provide consumers the *specific* information they need to understand the significant differences among brands of cigarettes, nor does it create incentives for cigarette companies to provide the kinds of cigarettes that are most in line with consumer preferences. Ideally, people should be able to determine the comparative risks of different smoking options.

## II. DO WE NEED MORE WARNINGS?

Informational regulations have become a foundation of right-to-know efforts that seek to apprise citizens of risks from environmental, product, and occupational exposures. Historically, a primary tool that the federal government has used in its efforts to reduce smoking is the requirement that hazard warnings be placed on cigarette packs and in cigarette advertising.

Beginning in 1965, Congress required that cigarette companies inform consumers that "Cigarette Smoking May Be Hazardous to Your Health."<sup>36</sup> This warning was modified in 1969 to indicate that "The Surgeon General Has Determined That Cigarette Smoking Is Dangerous to Your Health."<sup>37</sup> In 1984 Congress instituted a series of four rotating warnings regarding the health hazards of cigarettes, the

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of labour vary with the ease or hardship, the cleanliness or dirtiness, the honourableness or dishonourableness of the employment." *Id.*

35. For a review of product safety regulation and the rationales for it, see W. KIP VISCUSI ET AL., *ECONOMICS OF REGULATION AND ANTITRUST* 751-89 (2d. ed. 1995).

36. Federal Cigarette Labeling and Advertising Act of 1965, Pub. L. No. 89-92, § 4, 79 Stat. 282, 283 (amended 1970).

37. Public Health Cigarette Smoking Act of 1969, Pub. L. No. 91-222, § 4, 84 Stat. 87, 88 (effective July 1, 1970) (amended 1984).

benefits of quitting smoking, the risks to pregnant women, and the presence of carbon monoxide in cigarette smoke.<sup>38</sup> Table 1 summarizes the text of the warnings that have been in place from 1965 up to the present.

TABLE 1. CIGARETTE WARNING CONTENT SUMMARIES

| Warning period             | Warning content   |
|----------------------------|---|
| 1965-1969                  | "Caution: Cigarette Smoking May Be Hazardous to Your Health."   |
| 1969-1984                  | "Warning: The Surgeon General Has Determined That Cigarette Smoking Is Dangerous to Your Health."   |
| 1984-present<br>(rotating) | <div><div>1. "SURGEON GENERAL'S WARNING: Smoking Causes Lung Cancer, Heart Disease, Emphysema, And May Complicate Pregnancy."</div><div>2. "SURGEON GENERAL'S WARNING: Quitting Smoking Now Greatly Reduces Serious Risks to Your Health."</div><div>3. "SURGEON GENERAL'S WARNING: Smoking By Pregnant Women May Result in Fetal Injury, Premature Birth, And Low Birth Weight."</div><div>4. "SURGEON GENERAL'S WARNING: Cigarette Smoke Contains Carbon Monoxide."</div></div> |

The Proposed Resolution contains a new warnings policy that does not depart dramatically from prior practice. It includes a series of nine rotating warnings. Table 2 displays the text of these proposed warnings.<sup>39</sup>

TABLE 2. CIGARETTE WARNINGS MANDATED BY PROPOSED RESOLUTION

38. Comprehensive Smoking Education Act, Pub. L. No. 98-474, § 4, 98 Stat. 2200, 2201-02 (1984) (codified at 15 U.S.C. § 1333(a)(1) (1994)).

39. See Proposed Resolution, *supra* note 9, at 10.

## OF TOBACCO LITIGATION

- "WARNING: Cigarettes are addictive"
- "WARNING: Tobacco smoke can harm your children"
- "WARNING: Cigarettes cause fatal lung disease"
- "WARNING: Cigarettes cause cancer"
- "WARNING: Cigarettes cause strokes and heart disease"
- "WARNING: Smoking during pregnancy can harm your baby"
- "WARNING: Smoking can kill you"
- "WARNING: Tobacco smoke causes fatal lung disease in non-smokers"
- "WARNING: Quitting smoking now greatly reduces serious risks to your health"

Whereas earlier warnings alerted consumers to several hazards in a single warning, the proposed warnings would isolate fatal lung disease, cancer, and strokes and heart disease in separate warnings. For the first time, the warnings would designate cigarettes as being "addictive" and would alert smokers to the risk of "fatal lung disease in nonsmokers."<sup>40</sup> The proposal also contains the very explicit warning, "[s]moking can kill you."

The principal policy question is whether or not such warnings will make a difference. If warnings are to be effective, they must convey new information in a credible and effective manner.<sup>41</sup> The question then is twofold. First, do the proposed warnings convey any information that is truly new? Second, is the warning information received, processed, and credible? The warnings in the Proposed Resolution appear to contain little information that smokers have not already heard.

Consider smokers' awareness of the health risks of smoking. Data from a 1985 national survey and a 1991 regional telephone survey conducted in the Durham, North Carolina, area indicated that

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40. The focus of this second-hand smoke, or Environmental Tobacco Smoke (ETS), warning is surprising in that the available studies of ETS suggest that the risks of heart disease may dwarf the hazards of lung disease. See W. Kip Viscusi, *Cigarette Taxation and the Social Consequences of Smoking*, in *TAX POLICY AND THE ECONOMY* 51, 78-92 (James M. Poterba ed., 1995).

41. See WESLEY A. MAGAT & W. KIP VISCUSI, *INFORMATIONAL APPROACHES TO REGULATION* 87-106 (1992); W. KIP VISCUSI, *REFORMING PRODUCTS LIABILITY* 132-55 (1991); W. KIP VISCUSI & WESLEY A. MAGAT, *LEARNING ABOUT RISK: CONSUMER AND WORKER RESPONSES TO HAZARD INFORMATION* 125-30 (1987) [hereinafter VISCUSI & MAGAT, *LEARNING ABOUT RISK*].

smokers were aware of the fatal lung cancer risks and the mortality risks of smoking.<sup>42</sup> This Article supplements the previous literature with new survey evidence based on a national telephone survey undertaken in February 1997.<sup>43</sup> The sample consisted of 982 people, of whom 234 were smokers.

When eliciting risk perceptions regarding smoking, the key factor is how the health outcome is defined. It is noteworthy that the health outcomes that I focused on, lung cancer and death risks, are both well-defined and severe risks. The results from earlier surveys indicate that the responses to a lung cancer risk question are very similar to those of a lung cancer mortality risk question.<sup>44</sup> This 1997 survey included a lung cancer risk question to provide comparability with the 1985 national survey.

A second factor that affects the meaningfulness of the survey is how the risk question is asked. The approach I have taken in this and in past surveys is to establish a well-defined quantitative metric so that different people could rate the degree of hazards in a comparable fashion. Thus, simply asking people whether smoking is "risky" has no meaningful quantitative content because different people may have different ideas about what constitutes a "risky" product. To eliminate that problem, I worded the lung cancer question as follows: "Out of every 100 smokers, how many of them do you think will develop lung cancer *because* they smoke?"

Although this question asks for an overall risk rating, not the specific risk to the smoker, it is the most natural way to elicit a probability assessment. Respondents to an objective risk scale give answers that in past studies have reflected risks to themselves, not simply risks to others. Workers confronting a similar linear probabilistic scale gave job risk assessments that closely parallel the objective risks of the workers' jobs.<sup>45</sup> These subjectively reported risk perceptions on

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42. See VISCUSI, SMOKING, *supra* note 6, at 76-80.

43. As in the case of the national survey undertaken in 1985, the research firm used for this new survey was Audits & Surveys, Inc., of New York.

44. The 1991 regional sample believed that the lung cancer mortality risk was 0.38. See VISCUSI, SMOKING, *supra* note 6, at 77. The 1985 national survey found that the population perceived the lung cancer risk as 0.43, *see id.* at 69, and the 1997 national sample believed that the lung cancer risk was 0.47. The statistics from the 1997 survey and the exact wording of the survey question appear in Table 3 *infra*. These statistics were calculated by the author using the raw data files compiled by the surveyors.

45. See W. Kip Viscusi & Charles O'Connor, *Adaptive Responses to Chemical Labels*, 74 AMER. ECON. REV. 5 (1984). The implication is that using objective risks scales such as the ones that I have used have in fact generated a variety of market responses to the risk, which is

the part of workers generated similar wage premiums for risk, as have been found in compensating differentials studies using objective job risk data for worker industries.<sup>46</sup> A final factor indicating that people think that smoking is as risky for themselves as they think it is for others is that smoking risk assessments have a substantial effect on the smoking probability. If the hazards of smoking were only pertinent to others, not to the respondent, they should not affect the respondent's smoking behavior. Based on the earlier 1985 survey results, I found that if people understood the lung cancer risk of smoking accurately, as opposed to overestimating it,<sup>47</sup> the societal smoking rate would increase by 6.5-7.5%.<sup>48</sup>

The 1997 survey results, reported in Table 3, show a substantial perception of the lung cancer risk associated with smoking. Overall, people believe that there is a 47% chance of developing lung cancer from smoking.<sup>49</sup> Smokers estimate the risk at 40%. In contrast, scientific estimates of the lung cancer mortality risks from smoking are considerably smaller—6% to 13%.<sup>50</sup> Only nine percent of the sample believes that the lung cancer risk is below five percent and only sixteen percent of the sample believes that risk to be at or below ten percent. Thus, the overwhelming majority of the sample *overestimates* the lung cancer risks associated with smoking. These responses to the lung cancer question could, however, be overstated to the extent that respondents include other smoking risks as part of their response to the lung cancer risk assessment.

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what one would expect if people truly believed that the risks were going to affect them and not simply others.

46. For a comparison of the implicit value of a job implied by these results and by other studies, see W. KIP VISCUSI, *FATAL TRADEOFFS* 61-63 & tbl. 4-2 (1992) [hereinafter VISCUSI, *FATAL TRADEOFFS*].

47. See *infra* text accompanying notes 50-51.

48. See VISCUSI, *SMOKING*, *supra* note 6, at 100.

49. Because almost all cases of lung cancer are fatal, using the lung cancer fatality risk reference point for judging the accuracy of lung cancer risk perceptions is a close approximation to the risk of lung cancer overall. The U.S. Department of Health and Human Services observed in a 1982 report: "The five-year survival rate for lung cancer is less than 10%. See *Mortality and Morbidity Weekly Report*, February 26, 1982/31(7); 77-80. In a more recent study, estimates suggested that the lung cancer mortality rate was 94% of the value of the overall lung cancer incidence rate. More specifically, but 1986 the lung cancer incidence rate was 55.5 per 100,000 persons and the lung cancer death rate was 52.1 per 100,000 persons. See *Mortality and Morbidity Weekly Report*, December 7, 1990/39(48); 875, 881-883.

50. See *id.* at 70 tbl.4-3 (reporting 1991 estimates). These estimates were based on U.S. government sources, including Reports of the Surgeon General of the United States. See *id.* at 70 n.23. Since the original sources did not calculate the probability, I used their statistics on total illnesses and deaths to calculate the probability in my book. See *id.*

TABLE 3. DISTRIBUTIONS OF LUNG CANCER AND DEATH RISK PERCEPTIONS FOR CIGARETTE SMOKING

| Risk range      | Lung cancer risk <sup>a</sup> |                              | Death risk <sup>b</sup>  |                              |
|-----------------|-------------------------------|------------------------------|--------------------------|------------------------------|
|                 | Frequency in full sample      | Frequency in current smokers | Frequency in full sample | Frequency in current smokers |
| Risk < 0.05     | 0.055                         | 0.094                        | 0.040                    | 0.068                        |
| 0.05<Risk<=0.10 | 0.044                         | 0.056                        | 0.037                    | 0.056                        |
| 0.10<Risk<=0.20 | 0.092                         | 0.112                        | 0.081                    | 0.107                        |
| 0.20<Risk<=0.30 | 0.124                         | 0.137                        | 0.110                    | 0.115                        |
| 0.30<Risk<=0.40 | 0.085                         | 0.107                        | 0.078                    | 0.085                        |
| 0.40<Risk<=0.50 | 0.033                         | 0.034                        | 0.067                    | 0.077                        |
| 0.50<Risk<=0.60 | 0.212                         | 0.223                        | 0.192                    | 0.226                        |
| 0.60<Risk<=0.70 | 0.077                         | 0.052                        | 0.069                    | 0.073                        |
| 0.70<Risk<=0.80 | 0.109                         | 0.090                        | 0.119                    | 0.064                        |
| 0.80<Risk<=0.90 | 0.065                         | 0.021                        | 0.077                    | 0.026                        |
| 0.90<Risk<=0.99 | 0.057                         | 0.021                        | 0.072                    | 0.051                        |
| Risk = 1.00     | 0.047                         | 0.052                        | 0.056                    | 0.051                        |
| Mean risk       | 0.468                         | 0.395                        | 0.501                    | 0.424                        |
| sample size     | 981                           | 233                          | 982                      | 234                          |

<sup>a</sup> Out of every 100 cigarette smokers, how many of them do you think will develop lung cancer *because* they smoke?

<sup>b</sup> Out of every 100 cigarette smokers, how many of them do you think will die from lung cancer, heart disease, throat cancer, or any other illness *because* they smoke cigarettes?

To account for this potential shortcoming, the survey included a question on the overall fatality risk associated with smoking. Respondents were asked the following question: "Out of every 100 smokers, how many of them do you think will die from lung cancer, heart disease, throat cancer, or any other illness because they smoke cigarettes?" It should be emphasized that the phrasing of this question elicited an aggregate response to *all* risks rather than asking for each mortality separately—such a piecemeal approach conceivably could result in a *higher* aggregate estimated death risk. As the results

in Table 3 indicate, overall, people believe that there is a 50% chance of dying from smoking, with current smokers believing that the chance is 42%.

Once again, these responses are considerably higher than the actual mortality risks of smoking, but to a lesser extent than were the responses to the lung cancer question. Scientists have estimated that the lifetime mortality risk from smoking ranges from 18% to 36%.<sup>51</sup> Thus, the average mortality risk assessed by smokers exceeds even the upper bound of the scientists' estimates of the mortality risk level.

Although these results indicate a general awareness of risk, one might hypothesize the existence of particular problem groups that are not as aware of the risks associated with cigarettes. Young smokers are one group that has received substantial recent attention. The 1985 cigarette smoking survey included some respondents ages sixteen to twenty-one.<sup>52</sup> A common belief is that younger smokers are ignorant of the risks of smoking. However, these younger respondents assessed a *higher* risk of lung cancer than did older segments of society—49% for the young group versus 43% for the sample as a whole.<sup>53</sup> This is not surprising, however, since this younger generation has been raised in a much stronger anti-smoking environment than were their parents.

More qualitative evidence tells much the same story. The Monitoring the Future Project asked high school seniors a series of questions regarding their perceptions of the riskiness and attractiveness of smoking.<sup>54</sup> These students seemed quite aware that smoking is risky, and this belief has grown over time. The percentage that believe that smoking a pack or more a day holds great risk increased from 56% in 1976 to 69% in 1991.<sup>55</sup> In 1991, 72% of these seniors considered smoking a dirty habit, 74% preferred to date nonsmokers, and 61% believed that becoming a smoker reflects poor judgment.<sup>56</sup>

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51. *See id.*

52. *See id.* at 62. To reflect the rising legal smoking age, the 1997 survey focused on respondents age 18 and above. Thus, more recent data on youth smoking are not available.

53. *See* VISCUSI, SMOKING, *supra* note 6, at 123 tbl.6-2.

54. *See* U.S. DEP'T OF HEALTH & HUMAN SERVS., YOUTH & TOBACCO: PREVENTING TOBACCO USE AMONG YOUNG PEOPLE, A REPORT OF THE SURGEON GENERAL 66 tbl.18 (U.S. Dep't of Educ. ed., 1995).

55. *See id.*

56. *See id.*



Table 4 illustrates the extent to which risk assessments are insensitive to the kinds of basic smoking information that are included in the various cigarette warnings.

TABLE 4. PROFILE OF GROUPS WHO HAVE HEARD IDEAS ABOUT CIGARETTE SMOKING

|   | Fractions who have heard idea, their mortality risk perception, and, in parentheses, standard error of mean risk |                  |                |                  |               |                  |           |                  |
|---|--|------------------|----------------|------------------|---------------|------------------|-----------|------------------|
|   | Full sample  |                  | Current smoker |                  | Former smoker |                  | Nonsmoker |                  |
|   | Heard  | Risk             | Heard          | Risk             | Heard         | Risk             | Heard     | Risk             |
|   |  |                  |                |                  |               |                  |           |                  |
| Cigarette smoking will most likely shorten life                   | 0.968  | 0.473<br>(0.009) | 0.967          | 0.399<br>(0.019) | 0.981         | 0.462<br>(0.019) | 0.961     | 0.516<br>(0.013) |
| Cigarette smoking is dangerous to a person's health               | 0.986  | 0.471<br>(0.009) | 0.984          | 0.396<br>(0.018) | 0.992         | 0.464<br>(0.019) | 0.984     | 0.513<br>(0.013) |
| Cigarette smoking is bad for a person's health, but not dangerous | 0.361  | 0.454<br>(0.016) | 0.329          | 0.388<br>(0.030) | 0.327         | 0.413<br>(0.035) | 0.397     | 0.499<br>(0.021) |
| Cigarette smoking is not bad for a person's health                | 0.314  | 0.473<br>(0.017) | 0.222          | 0.339<br>(0.037) | 0.322         | 0.452<br>(0.034) | 0.356     | 0.523<br>(0.021) |
| Cigarette smoking causes flat feet                                | 0.032  | 0.510<br>(0.052) | 0.016          | 0.215<br>(0.076) | 0.033         | 0.369<br>(0.091) | 0.039     | 0.638<br>(0.057) |

The various rows of Table 4 correspond to the kinds of statements that people may have heard regarding smoking, ranging from "cigarette smoking will most likely shorten life" to defenses of cigarette smoking, such as "cigarette smoking is not bad for a person's health." The final question, whether "cigarette smoking causes flat feet," is designed to distinguish individuals who either are particularly ill-informed or are not giving reasoned responses to the survey questions. Virtually everyone in the sample—from 97% to 99% per-

cent—had heard each of the two adverse statements regarding the risks of cigarettes. Moreover, one's smoking status did not affect whether one had heard either of these types of statements regarding cigarette risks. In contrast, roughly one-third of the sample had heard the various statements exonerating cigarettes of risk. Perhaps surprisingly, it is current smokers who exhibit the lowest fraction of people—just 22%—who had heard that “cigarette smoking is not bad for a person's health.” Clearly, the hazards of smoking are not a secret, and are not unknown to smokers themselves.

In addition to listing what fraction of the sample had heard the various ideas concerning cigarettes, Table 4 lists the associated mortality risk perception conditional upon both hearing the particular statement and falling into the sample group designated by the column heading. Thus, for the full sample who had heard that “cigarette smoking is not bad for a person's health” the risk value is the average mortality risk only for people who had heard this statement. People who have not heard it are excluded from this calculation. In every case, smokers have a lower risk assessment than nonsmokers and former smokers, even though they have heard the same particular type of information. Nevertheless, the risk assessments are quite high for smokers. To the extent that a lower assessed risk of smoking will lead one to be more willing to engage in smoking behavior, the lower risk beliefs of smokers are not unexpected.

In order to fully understand the risks associated with smoking, people must also understand what length of life is at stake. For example, if people underestimate the life expectancy that will be lost due to smoking, then even an accurate assessment of the probability of premature mortality will lead to an inadequate assessment of the risk. To address this issue the survey asked people the life expectancy questions indicated in the notes beneath Table 5.

TABLE 5. RESPONDENTS' ASSESSED LIFE EXPECTANCY LOSS DUE TO SMOKING

| Sample             | Mean<br>(standard error of the mean) |                      |               |
|--------------------|--------------------------------------|----------------------|---------------|
|                    | Males <sup>a</sup>                   | Females <sup>b</sup> | Total         |
| Full sample        | 10.1<br>(0.4)                        | 14.8<br>(0.4)        | 12.6<br>(0.3) |
| Current smokers    | 7.9<br>(0.7)                         | 12.3<br>(0.8)        | 9.9<br>(0.5)  |
| Current nonsmokers | 10.9<br>(0.4)                        | 15.5<br>(0.4)        | 13.4<br>(0.3) |
| Former smokers     | 9.6<br>(0.6)                         | 14.8<br>(0.7)        | 12.3<br>(0.5) |
| Never smoked       | 11.6<br>(0.5)                        | 15.8<br>(0.5)        | 14.0<br>(0.4) |

<sup>a</sup> (Asked Males Only) As you may know, an average 21-year old male would be expected to live to the age of 73. What do you think the life expectancy is for the average male smoker?

<sup>b</sup> (Asked Females Only) As you may know, an average 21-year old female would be expected to live to the age of 80. What do you think the life expectancy is for the average female smoker?

Thus, the respondent was informed of the average life expectancy for the person's gender group and then asked what he or she believed was the average life expectancy for the average smoker of the person's gender group. Table 5 shows the difference, for various groups of respondents, between the respondents' estimated life expectancy for a smoker and the average life expectancy. So, for example, male former smokers estimated that the average male smoker will live 9.6 fewer years than will the average nonsmoker. Overall, people believe that cigarette smoking leads to a life expectancy loss of 12.6 years. The assessed life expectancy loss by current smokers is somewhat less, ranging from 7.9 years for males to 12.3 years for females. Each of these life expectancy loss estimates is greater than the actual life expectancy lost, which estimates suggest is probably in the vicinity of 3.6 to 7.2 years.<sup>57</sup> As in the case of the mortality risk prob-

57. These and other life expectancy loss estimates appear in VISCUSI, *SMOKING*, *supra*

ability assessments, the evidence suggests that smokers believe the risks to be lower than do nonsmokers, but that smokers nevertheless *overestimate* the hazards associated with smoking.

People also appear to be aware of the difficulty of quitting smoking. For decades, the Surgeons General of the United States designated smoking as a problem of habituation rather than addiction.<sup>58</sup> More recently, then-Surgeon General C. Everett Koop attributed the difficulty of quitting smoking to "addiction."<sup>59</sup> Although the character of the medical designation has changed, in each case the basic thrust of the message is the same—quitting smoking is hard. The article by Joni Hersch in this issue of the *Duke Law Journal* presents the pertinent data.<sup>60</sup> When polled regarding the difficulty of quitting, 13% of smokers indicated that smoking is addictive, 26% said that it is a habit, 57% indicated that it is both a habit and an addiction, and only 4% said that it was neither.<sup>61</sup> Still, while changing smoking behavior is difficult, it is not impossible. Millions of Americans have quit smoking—about half of all people who have ever been smokers.<sup>62</sup>

The evidence is less extensive on the public awareness of the hazards associated with environmental tobacco smoke (second-hand smoke). Nonetheless, there appears to be some evidence that people have been aware of these risks for some time. In 1977, sixty-eight percent of the respondents to a Gallup poll indicated that they supported specified areas set aside for smoking, sixteen percent favored no smoking in public areas, and only ten percent supported no restrictions on smoking in public places.<sup>63</sup> By 1988, sixty percent of the population supported a complete ban of smoking in all public places. Presumably, this change has not occurred simply because of a con-

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note 6, at 80.

58. See PUBLIC HEALTH SERV., U.S. DEP'T OF HEALTH, EDUC., AND WELFARE, PUB. NO. 1103, SMOKING AND HEALTH: REPORT OF THE ADVISORY COMMITTEE TO THE SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE 349-54 (1964).

59. See PUBLIC HEALTH SERV., U.S. DEP'T OF HEALTH & HUMAN SERVS., PUB. NO. (CDC) 88-8406, THE HEALTH CONSEQUENCES OF SMOKING: NICOTINE ADDICTION, A REPORT OF THE SURGEON GENERAL 9 (1988).

60. See Hersch, *supra* note 25, at 1157.

61. See *id.* For more discussion of the smoking-related beliefs of teens, see *id.* at 1158-61.

62. See U.S. DEP'T OF HEALTH & HUMAN SERVS., PUB. NO. (CDC) 90-8416, THE HEALTH BENEFITS OF SMOKING CESSATION: A REPORT OF THE SURGEON GENERAL 593-94 tbl.4 (1990).

63. The Gallup Poll statistics reported in this paragraph are summarized in VISCUSI, SMOKING, *supra* note 6, at 52 tbl.3-3.

cern with the smell of smoke, which has always been well known. Awareness of the health risks to third persons has surely been heightened by recent widespread concern with environmental tobacco smoke,<sup>64</sup> and by the smoking restrictions implemented by private entities such as restaurants and businesses.<sup>65</sup>

The overwhelming implication of these different sets of statistics is that people are generally aware of the hazards of smoking. As a consequence, it is unlikely that additional hazard warnings intended simply to alert people to the general risks of smoking will have much effect. This does not imply that there is no informational role that the government can play. It does suggest, however, that a truly useful campaign would need to be more imaginative, and more than just a minor variation on past informational approaches.

How might one respond to this evidence suggesting that smokers understand the risks? Elsewhere in this issue, Paul Slovic offers four possible critiques.<sup>66</sup> First, he argues that assessing that there is a probability of some adverse outcome does not imply that people understand the severity of the outcome.<sup>67</sup> However, in my surveys the outcome is a well-defined severe health outcome, including lung cancer, death, and life expectancy loss. Death and cancer are among the most highly valued and severe health consequences.

A second shortcoming that he suggests is that people may be subject to an optimism bias and not believe that the risks will actually affect them.<sup>68</sup> If that were the case, then we would not observe the

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64. See generally *Good Morning America: New Second-Hand Smoke Study* (ABC television broadcast, May 20, 1997), available in LEXIS, News Library, Curnws File (reporting on new study which found that regular exposure to second-hand smoke doubles the risk of heart attacks in female nonsmokers); *Second-Hand Smoke Hurts Millions of Children Study*, Reuters World Service, Apr. 9, 1996 ("Four million children are sent to a doctor each year because they are affected by second-hand smoke."); *Asthma, Bronchitis; Second-Hand Smoke Blamed for Attacks Among Young*, CHI. TRIB., Feb. 4, 1998, at C7; *Second-Hand Smoke May Increase Heart Disease in Young*, MED. INDUSTRY TODAY, Sept. 4, 1997; *Second-Hand Smoke Increases Risk of Childhood Ear Infections*, AGENCE FRANCE PRESSE, Feb. 9, 1998.

65. Many hotels, for example, have established non-smoking floors. See James T. Yenckel, *Hotel Rooms for Nonsmokers*, WASH. POST, June 14, 1987, at E1. The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) issued a standard in January 1991 requiring acute-care hospitals to be smoke-free effective January 1992. See Anne M. Joseph, *Determinants of Compliance with a National Smoke-Free Hospital Standard*, 274 JAMA 491, 491 (1995). Hospitals have been very receptive to this standard. See Daniel R. Longo et al., *Smoking Bans in U.S. Hospitals: Results of a National Survey*, 274 JAMA 488, 489 (1995) (reporting that 95.6% of the 3,327 U.S. hospitals surveyed were in compliance with the JCAHO standard).

66. See Paul Slovic, *Do Adolescent Smokers Know the Risks?*, 47 DUKE L.J. 1133 (1998).

67. See *id.* at 1133.

68. See *id.* at 1135.

strong relationship between smoking risk probabilities and the likelihood of smoking that is now observed. Moreover, the aforementioned survey evidence does indicate that smokers already believe that they have suffered adverse health consequences. Indeed, Slovic's own research on adolescents fails to indicate any significant difference between risks to oneself and one's peers.<sup>69</sup>

Slovic's third potential criticism is that these risk questions do not address the repetitive and cumulative nature of the risk.<sup>70</sup> However, asking about lifetime mortality risks and life expectancy loss quite explicitly does capture the long-term health consequences of smoking hazards. Moreover, Slovic's discussion of cumulative risks confuses two quite different concepts—a repetition of independent and identical risks over time versus a nonlinear dose-response relationship for repeated exposures to a particular hazard.

His final criticism is that smokers do not understand that smoking is addictive.<sup>71</sup> Once again, this unsupported claim is not borne out by the aforementioned survey evidence, which indicates that smokers are almost unanimous in believing that smoking is habit forming, addictive, or both. Quite simply, people know that quitting smoking is hard to do.

The original survey evidence offered by Slovic, based on a survey at one high school, in no way addresses any of these four problems that he raises. Typical of the type of question he asks is whether the respondent agrees that "[e]very single cigarette smoked causes a little bit of harm."<sup>72</sup> What is meant by this, either in terms of the likelihood of the harm or the character of the harm is not specified and interpretations may vary across respondents. His questions are particularly subject to his first criticism of smoking risk perception analyses, which is that people may not understand the severity of the consequences involved.

Moreover, none of his questions address the role of optimism bias any more than do the questions analyzed in my studies. Similarly, his third and fourth criticisms, that studies must address the cumulative and addictive nature of the risk, once again are not ad-

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69. See Benthin et. al., *A Psychometric Study of Adolescent Risk Perception*, 16 JOURNAL OF ADOLESCENCE 153, 162 (1993). The data presented indicate a personal risk to the smoker of 4.31 and risks to one's peers of 4.42, based on a 7 point scale.

70. See Slovic, *supra* note 66, at 1137.

71. See *id.* at 1138.

72. *Id.* at 1136.

dressed with any more concreteness and specificity than is achieved by my questions that explore the perceived life expectancy associated with smoking or inquire about whether respondents believe that smoking is habit forming or addictive.

Any meaningful study of smoking risk beliefs ultimately must involve a well defined quantitative metric in which it is possible to ascertain whether the individual over-assesses or under-assesses the risk based on the survey response. My smoking risk questions permit such an assessment. However, the qualitative questions posed by Slovic that ask people to assess degrees of agreement with statements such as, "[t]here is really no risk at all for the first few years,"<sup>73</sup> do not permit one to make any precise judgments as to whether the people surveyed correctly perceive the risk. What, for example, is the correct response to such statements? Strongly agree? Agree? Disagree? Strongly disagree? Slovic's qualitative measures are without empirical content, as they fail to enable us to make any judgment regarding whether smokers overestimate or underestimate the risks associated with smoking.

### III. REGULATORY OPPORTUNITIES

To get a sense of the potential opportunities for beneficial cigarette regulation it is helpful to analyze the manner in which cigarette regulations have affected smoking behavior to date. A useful starting point is to analyze the trends in cigarette consumption over time. Figure 1 provides information on two significant cigarette consumption trends over the past half century.

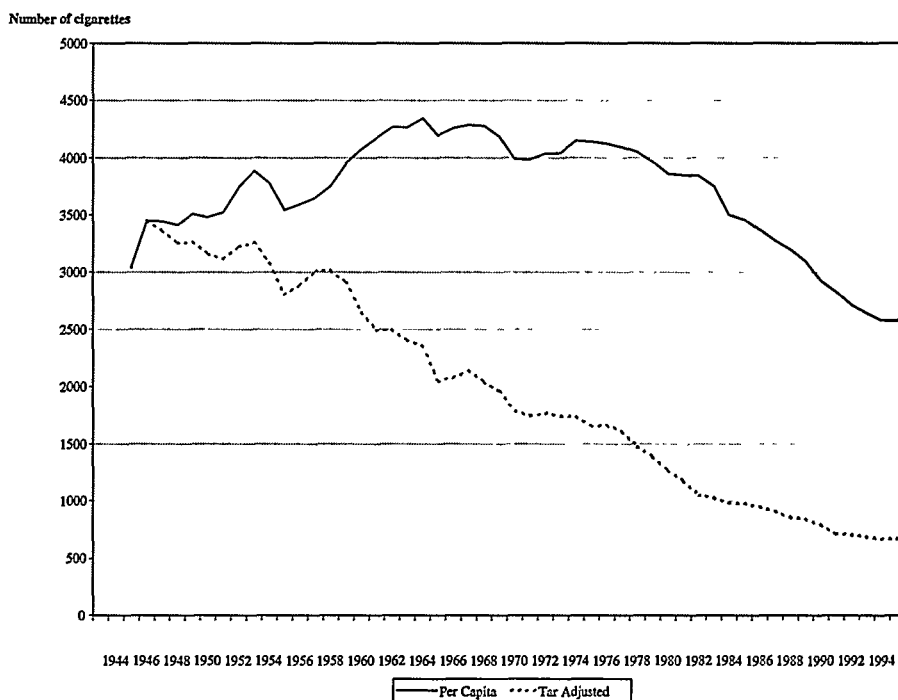
The solid line represents the number of cigarettes consumed per capita over the last half century. The dotted line represents the per capita cigarette consumption adjusted for the level of tar in the cigarettes. The tar rating for cigarettes is a widely publicized single summary statistic that is indicative of the chemical hazards in the cigarette.<sup>74</sup>

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73. *Id.*

74. The degree to which tar levels are correlated with the riskiness of cigarettes remains a matter of dispute. Lower-tar cigarettes appear to reduce the lung cancer risks of smoking, but not many of the other hazards. See OFFICE ON SMOKING AND HEALTH, U.S. DEP'T OF HEALTH & HUMAN SERVS., REDUCING THE HEALTH CONSEQUENCES OF SMOKING: 25 YEARS OF PROGRESS, A REPORT OF THE SURGEON GENERAL 316 (1989) [hereinafter DHSS, REDUCING THE HEALTH CONSEQUENCES OF SMOKING].

Figure 1. U. S. Per Capita Cigarette Consumption and Tar-Adjusted Consumption, 1944-1994



The trend in smoking consumption has been consistently downward since the mid-1970s. On the other hand, from the mid-1960s to the mid-1970's, per capita consumption was flat—and per capita consumption actually *rose* significantly from 1944 to 1964. Thus, the major effect of the initial wave of cigarette warnings, enacted in 1965, was to flatten the growth in cigarette consumption rather than to reverse the trend and generate a decline in consumption. By the mid-1990s, per capita cigarette consumption had declined from its peak but was not substantially below its level of fifty years earlier.

The trend for tar-adjusted cigarette consumption reflects a much starker shift in cigarette smoking behavior. Whereas cigarettes averaged 46.1 mg. tar per cigarette in 1944, by 1994 the average tar level in cigarettes was 12.0 mg. Tar-adjusted cigarette consumption is calculated by weighting the per capita consumption figures for a given year by the tar level in that year relative to its 1944 level. If one were to assume for simplicity that the risk of cigarettes is linearly related



to their tar level, then over this fifty-year period the risk of cigarettes would have declined by almost three-fourths.

The dramatic decline in the tar-adjusted per capita consumption of cigarettes reflects an apparent desire on the part of smokers to reduce the riskiness of smoking cigarettes. To the extent that smokers are responding to health concerns, they have done so primarily by choosing lower-tar cigarettes.<sup>75</sup>

A particularly dramatic decline in average tar levels occurred from 1957 to 1960. This period, which has been called the great "Tar Derby," was one during which cigarette companies competed in terms of the tar levels of their cigarettes.<sup>76</sup> Cigarette companies' advertisements touted the lower tar levels of their brands as compared to that of other brands. Kent cigarettes, for example, claimed that they had "significantly less tars and nicotine than any other filter brand."<sup>77</sup> A Marlboro ad declared: "Today's Marlboro—22% less tar, 34% less nicotine."<sup>78</sup> Duke cigarettes touted the fact that their product offered the "lowest tar of all lo-tar cigarettes."<sup>79</sup>

As a result, during this very short period of the great Tar Derby, the average tar and nicotine levels of cigarettes purchased by consumers decreased by one-third.<sup>80</sup> Competition by cigarette companies with respect to the safety dimension of their products elicited a substantial consumer response. Unfortunately, this progress was not permanent. The Federal Trade Commission (FTC) did not embrace this low-tar competition and instead negotiated an industry agreement to ban tar and nicotine advertising in 1960.<sup>81</sup> Although the official rationale for this action remains unclear,<sup>82</sup> it played an obstructionist role by discouraging the provision of safety-related information about cigarettes to consumers and by impeding the pub-

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75. See Laura Klepacki, *Low-tar Brands Light Up Cigarette Category*, SUPERMARKET NEWS, Jan. 28, 1991, at 21 ("Health warnings and antismoking campaigns have caused some smokers to cut back. But many, rather than quit, are switching to low- and very-low-tar cigarettes.").

76. The "Tar Derby" is discussed in VISCUSI, SMOKING, *supra* note 6, at 39-40. For a more detailed discussion, see JOHN E. CALFEE, FTC WORKING PAPER NO. 134, CIGARETTE ADVERTISING, HEALTH INFORMATION AND REGULATION BEFORE 1970 (1985).

77. CALFEE, *supra* note 76, at 35-36.

78. *Id.* at 36.

79. *Id.*

80. See *id.* at 37 n.138.

81. See VISCUSI, *supra* note 2, at 39-40.

82. See *id.* One possibility is that the Surgeon General did not support low-tar cigarettes. See *id.*; CALFEE, *supra* note 76, at 45.

lic's ability to choose lower-tar cigarettes. Due in part to the pressure exerted by the American Cancer Society to reverse this ill-conceived policy of suppressing tar and nicotine information,<sup>83</sup> the FTC relented and ultimately permitted tar and nicotine advertising. The initial step was the publication of tar and nicotine levels by the FTC in 1967.<sup>84</sup> By 1971, a new voluntary industry agreement required cigarette companies to disclose tar and nicotine levels.<sup>85</sup>

A final noteworthy pattern in Figure 1 is the flattening of the tar-adjusted cigarette consumption levels in the 1990s. The rise of generic cigarettes, and their associated high tar levels,<sup>86</sup> may have led to a flattening of the decline in tar-adjusted consumption amounts. This phenomenon highlights a potential danger of regulating cigarettes in a way that would make cigarette brands indistinguishable.<sup>87</sup> All cigarettes are not equally risky. Suppose, for example, that suppressing cigarette advertising and brand identification led consumers to have less brand attachment and to focus more on the price rather than on the quality of cigarettes. In such a case, cheaper cigarettes would become relatively more attractive. If these cigarettes also tended to have higher tar and nicotine levels, as is the case with current generic cigarettes, then the effect of such a policy could be to increase rather than to decrease the risks of smoking.

Underlying this discussion is an implicit assumption that smokers now attempt to match the kind of cigarettes they purchase with their concern for the health hazards of cigarettes. Available evidence indicates that such matching does in fact occur. Overall, 87.1% of people who smoke low-tar cigarettes ( $\leq 3$  mg. tar/cigarette) express concerns about the health consequences of smoking.<sup>88</sup> In contrast, only 54.8% of those who smoke high-tar cigarettes ( $\geq 21$  mg. tar/cigarette) express such health concerns.<sup>89</sup>

It would be very useful if the government provided risk ratings for cigarettes. Current tar and nicotine ratings provide partial infor-

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83. See VISCUSI, *SMOKING*, *supra* note 6, at 40; CALFEE, *supra* note 76, at 55.

84. See VISCUSI, *SMOKING*, *supra* note 6, at 40.

85. See *id.*

86. See Viscusi, *Cigarette Taxation and the Social Consequences of Smoking*, *supra* note 40, at 62.

87. One such possibility would be plain cigarette packaging in which the color on packages and distinctive lettering would be replaced by tombstone advertising in which only the brand name was indicated in black and white.

88. See VISCUSI, *SMOKING*, *supra* note 6, at 150 & 152 n.9.

89. See *id.*

mation, but this information is neither complete nor conclusive. For example, there is a theory that people tend to inhale lower-tar cigarettes more deeply, thus effectively increasing the risks of such cigarettes.<sup>90</sup> If this hypothesis is true, the risk of smoking a product is not fully captured by a simple assessment of its tar rating.

Asking the individual consumer to research such scientific issues is unreasonable. Trial and error with different kinds of cigarettes may be instructive with respect to immediate health effects, such as shortness of breath, but it does not provide sufficient information with respect to the longer-term consequences of smoking. The government could play a productive role by gathering and disseminating research regarding the health hazards of cigarettes. The government could accomplish this by funding its own central research effort, so as to avoid the duplicative efforts of research by each individual cigarette company. This effort could be financed by cigarette taxes. In addition, governmental research would presumably have more credibility than would privately funded research efforts, which the public might view more skeptically because of the role of the private vested interests.

Another possible governmental role might be to establish standards and to review the scientific research undertaken by the cigarette industry. In this scenario, the cigarette industry itself would presumably assume responsibility for testing new brands and their health consequences, just as pharmaceutical companies are responsible for testing the implications of new pharmaceutical formulations. In the case of prescription drugs, the FDA has established testing guidelines to which pharmaceutical companies must adhere as part of the testing process.<sup>91</sup> The FDA then reviews these test results and mandates additional study if necessary.<sup>92</sup> Similarly, the FDA could establish guidelines for testing alternative cigarette products and rating their safety. As with any valid scientific procedure, the results of such tests should be replicable so that any scientist who performed the tests in

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90. The FTC has recently proposed analyzing cigarette smoke for tar and nicotine levels using a test that simulates intakes for those smokers who take more and deeper drags from their cigarettes. See Jeff Levine & Donald Van de Marck, *New Tobacco Advertising* (CNN-FN broadcast, Sept. 10, 1997), available in LEXIS, News Library, Curnws File. The new method could produce results that reflect tar and nicotine levels that are four to five times higher than those found using the standard method. *Id.*

91. The detailed requirements relating to test phases may be found in 21 C.F.R. § 312(a)-(c) (1998).

92. See *id.*

conformance with the FDA guidelines would generate the same results.

#### IV. PROMOTING SAFER CIGARETTES

The FDA could play a highly productive role by rating the comparative safety of cigarettes, thus providing consumers with information that would enable them to better match their choices of cigarettes with their own risk preferences. One could envision a rating system that captured not only the risk characteristics of cigarettes, but also additional factors, such as the manner in which different kinds of cigarettes are smoked.<sup>93</sup> In this manner, the FDA could publish comparative risk ratings for cigarettes that would enable consumers to assess the relative riskiness of their choices.

This kind of informational function has a substantial history in other areas. Point of purchase displays in supermarkets, for example, are often helpful in guiding consumers in their choice of products based on their nutritional value.<sup>94</sup> Comparative information about the bad attributes, such as salt or fat content, can have a greater effect on consumer choice than does information about positive attributes, such as vitamin content.<sup>95</sup> Thus, consumers often use comparative information to target aspects of a product that they wish to avoid. Comparative risk ratings of cigarettes would highlight the health hazards of cigarettes, thus providing the kind of information that would be particularly useful to health-conscious consumers.

Comparative risk information for cigarettes is not, however, tantamount to simply listing the chemical composition of cigarettes. Knowing that cigarettes contain, for example, arsenic, formaldehyde, or other chemicals would not be particularly instructive—even to a cancer specialist—without knowledge of the quantities in the cigarette smoke. To maximize usefulness, therefore, the information should be provided in a manner that does not require the consumer to make a risk assessment based on a chemical list, but instead provides an overall risk rating that summarizes the risk implications in a manner that can be understood. Such a risk rating need not be a sin-

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93. Thus, if smokers tend to inhale low-tar cigarettes more deeply, the rating system could reflect this.

94. See J. Edward Russo et al., *Nutrition Information in the Supermarket*, 13 J. CONSUMER RES. 48, 48-70 (1986).

95. See *id.* at 49 ("Survey evidence reveals that consumers see both positive and negative nutrients as important, but emphasize the negative.").

gle summary statistic. It may prove useful, for example, to have risk indices on multiple dimensions, such as cancer, heart disease, and respiratory ailments.

Formulating the risk information in such a manner could also eliminate some of the current distractions over cigarette additives. States such as Massachusetts have passed laws requiring disclosure of additive information,<sup>96</sup> and cigarette companies have already begun to respond by offering additive-free cigarettes, such as a Winston cigarette that contains no additives.<sup>97</sup> In terms of the overall risk, though, concern over additives is akin to concern about whether the car that ran you over also had lead paint on it. Cigarette smoking is a tremendously risky activity even using cigarettes without flavor enhancers or other artificial additives. The warnings effort should focus consumers' attention on the overall riskiness of each type of cigarette, rather than on potential distractions that could lull consumers into overestimating the safety of additive-free cigarettes.

Rating the comparative risks of cigarettes is, to a large extent, simply an extension of the current informational approach. Conceivably the FDA could also take the lead in fostering much more ambitious changes in the character of cigarettes. In much the same way as health, safety, and environmental regulations require safer plants and equipment and safer products,<sup>98</sup> the FDA likewise could act to promote the design of cigarettes with safer properties.

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96. See MASS. GEN. LAWS ANN. ch. 94, § 307B (West Supp. 1998). While the Liggett Group eventually chose to comply with the law, see Adrian Walker, *Liggett Lists Cigarette Ingredients, Becomes 1st Tobacco Firm to Support Mass. Law*, BOSTON GLOBE, Dec. 4, 1997, at C6, other tobacco companies threatened to pull their products from the Massachusetts market while they reformulate their ingredients, see Frank Phillips, *Tobacco Firms Mull Move Out of Mass.; Could Pull Brands Over Disclosure Law*, BOSTON GLOBE, Nov. 16, 1996, at B1, and brought a suit to block implementation of the law, arguing that the law forces them to reveal trade secrets. See *Philip Morris, Inc. v. Harshbarger*, No. Civ.A. 96-11599-6A0, 1997 WL 106930, at \*1 (D. Mass. Feb. 7, 1997). The federal district court judge granted a temporary restraining order, noting that the industry had demonstrated "a sufficient likelihood of success" in showing that the law is unconstitutional. See Frank Phillips, *Ruling Stalls Tobacco Disclosure Law; Future of Legislation in Question*, BOSTON GLOBE, Dec. 11, 1997, at B1.

97. See "All-Natural" Ads Boost Winston Sales, NEWS & REC. (GREENSBORO, N.C.), Jan. 14, 1998, at B4; Melanie Wells, *Winston Scores with "Additive-Free" Ads*, USA TODAY, Oct. 30, 1997, at 6B. The Winston ads have been attacked for being misleading by suggesting that the additive-free cigarettes are healthier than regular cigarettes. See Michael Murphy, *Tobacco Billboards Targeted; Woods Asks Judge to Pull Winston's "No Bull" Ads*, ARIZ. REPUBLIC, Mar. 6, 1998, at B1.

98. See generally VISCUSI, *FATAL TRADEOFFS*, *supra* note 46, at 148 (offering a detailed discussion of health, safety, and environmental regulations in this context); STEPHEN BREYER, *BREAKING THE VICIOUS CIRCLE: TOWARD EFFECTIVE RISK REGULATION* (1993) (same).

Consider the two traditional risk components of cigarettes—tar and nicotine. In the case of nicotine, which is primarily linked to the difficulty of quitting smoking, Philip Morris introduced several virtually nicotine-free cigarettes under the brand names Next and Merit-Free that were test marketed in 1991.<sup>99</sup> Rather than welcome these products, anti-smoking groups petitioned the FDA to designate nicotine as a drug and to initiate a broader range of regulatory actions against cigarettes.<sup>100</sup>

Perhaps the greatest technological innovation affecting cigarettes was the development of the Premier cigarette by R.J. Reynolds.<sup>101</sup> The Premier, which has subsequently been tested and marketed in a new design under the brand name Eclipse, does not burn tobacco.<sup>102</sup> Rather, in its initial design, the smoker lit a carbon tip at the end of the cigarette.<sup>103</sup> This tip in turn heated a capsule filled with porous beads coated with tobacco extract.<sup>104</sup> This vapor then traveled through tobacco papers to release even more tobacco flavor.<sup>105</sup>

Notwithstanding the technological sophistication of the new design, the Premier closely resembled conventional cigarettes in many respects. It had the external appearance of a cigarette—the smoker would smoke it in the same fashion and would hold it in the same manner. The Premier also delivered the nicotine level associated with conventional cigarettes. There was, however, one stark change. Since it did not burn tobacco the Premier caused less adverse biological activity than do other cigarettes.<sup>106</sup> Carbon monoxide risks remained, but the mainstream and sidestream smoke condensates were all less genotoxic than those of reference cigarettes.<sup>107</sup>

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99. See Martin Wolk, *Phillip Morris Tests New Low-Nicotine Cigarette*, REUTER BUS. REPORT, May 31, 1989; Douglas C. McGill, *Low-Nicotine Cigarette for Philip Morris*, N.Y. TIMES, June 1, 1989, at D1.

100. See *Groups Seek FDA Regulation of "De-Nicotined" Cigarettes*, CHI. TRIB., Apr. 8, 1991, at C3.

101. The general properties of the Premier cigarette are discussed in VISCUSI, *FATAL TRADEOFFS*, *supra* note 46 at 23-24, and are explored thoroughly in R. J. REYNOLDS TOBACCO CO., *CHEMICAL AND BIOLOGICAL STUDIES ON NEW CIGARETTE PROTOTYPES THAT HEAT INSTEAD OF BURN TOBACCO* (1988) [hereinafter *RJR STUDIES*].

102. See Jeremy Pearce, *New Cigarette Releases 90% Less Smoke, Yields Less Tar*, DET. NEWS, June 9, 1996.

103. See VISCUSI, *FATAL TRADEOFFS*, *supra* note 46, at 23.

104. See *id.*

105. See VISCUSI, *SMOKING*, *supra* note 2, at 146-47.

106. See *RJR STUDIES*, *supra* note 101, at xii.

107. See *id.* at 11 & tbl. 5. RJR did not limit its analysis to Premier cigarettes alone, but rather analyzed the reduced risk associated with smokeless cigarettes generally as well. See *id.*

Marketing this "safer" cigarette was a nontrivial task since cigarette companies are not permitted to make health claims on behalf of their products.<sup>108</sup> The Premier packaging referred to the "cleaner smoke," which was not a health claim but a reference to its overall smokeless character. The brochure attached to the cigarette pack described the Premier's characteristics as follows:

Premier is the first cigarette you smoke by *heating tobacco—not burning it*.

It's a breakthrough that changes the very composition of cigarette smoke—substantially reducing many of the controversial compounds found in the smoke of tobacco-burning cigarettes. Those that remain include carbon monoxide, but the amount of carbon monoxide is no greater than in the best-selling "lights." What it all comes down to is a cleaner smoke—for you and everyone around you.<sup>109</sup>

Viewed in abstract terms, cigarettes embody a number of characteristics. Many of these characteristics remained in the design of the Premier. One principal characteristic that was affected was a reduction in the taste associated with cigarettes—an effect that I found differed in degree depending on whether the cigarette was of the regular or menthol variety. In addition, the Premier did not burn tobacco, thus eliminating all risks associated with that particular process.<sup>110</sup> This new design was very much in the spirit of the technological design standards that have been mandated throughout the health, safety, and environmental area by federal regulatory agencies. When passengers in motor vehicles are unsafe, we mandate airbags and seatbelts to protect them.<sup>111</sup> Environmental regulations require the use of scrubbers to eliminate pollutants.<sup>112</sup> Technological solutions to risk problems represent the dominant government form of intervention to address the hazards we face. Yet, in the context of cigarettes, not only has there been no requirement of a technological nature im-

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*passim*.

108. FDA regulations require that all health claims made on the label of a product be approved by the FDA. See 21 C.F.R. § 101.14 (1998).

109. VISCUSI, SMOKING, *supra* note 2, at 147 (quoting language found on the label of Premier Cigarettes).

110. See *supra* notes 106-107 and accompanying text.

111. See 49 C.F.R. § 571.208 (1997).

112. For a detailed analysis of air pollution regulations, see ROBERT CRANDALL, CONTROLLING INDUSTRIAL POLLUTION: THE ECONOMICS AND POLITICS OF CLEAN AIR 5-16 (1983).

posed on cigarette design, but the government has never taken any active role in promoting design safety.

Instead, the reaction to the Premier cigarette was marked by an attitude of suspicion and distrust. A 1989 U.S. Surgeon General's report summarized these official concerns about the new product:

The marketing of a variety of alternative nicotine delivery systems has heightened concern within the public health community about the future of nicotine addiction. The most prominent development in this regard was the 1988 test marketing by a major cigarette producer of a nicotine delivery device having the external appearance of a cigarette and being promoted as "the cleaner smoke."<sup>113</sup>

To criticize this innovation because it was not the same as not smoking at all is to miss the fundamental contribution of this product. All products consist of multiple attributes, some of which affect risk aspects of the product and others of which affect other aspects of consumer demand. The Premier cigarette did not increase nicotine, one of the major risk components which is linked to habituation and addiction. Rather, the cigarette only manipulated two attributes, taste and cancer risk. The Premier largely eliminated the cancer risk, and the main price paid was a decrease in the taste provided to consumers. For smokers who claim that they smoke because they need to do something with their hands, they enjoy the act of smoking, or they enjoy the effect of the nicotine, this product would be a suitable alternative. For smokers for whom taste is an essential concern, on the other hand, this new product would not be as attractive as conventional cigarettes.

One should not be too critical of deficiencies in major safety innovations, such as the lack of a good taste in Premier cigarettes. Over time, as consumer demand for these products increases, there tends to be additional innovation which rectifies some of the initial shortcomings. For example, the original lap only model of seatbelts has been replaced by the more effective<sup>114</sup> lap and shoulder harness. Similarly, efforts are now underway to refine the design of airbags so

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113. See DHSS, REDUCING THE HEALTH CONSEQUENCES OF SMOKING, *supra* note 74, at 13.

114. National Safety Council President T.C. Gilchrist noted that, compared to lap-only seatbelts, "three-point lap and shoulder harnesses provide the best protection." *Safety Council Questions NTSB Seatbelt Study*, UPI, Aug. 13, 1986, available in LEXIS, News Library, Arcnws File.



that they do not pose as great a risk to smaller passengers.<sup>115</sup> One would expect similar improvements in the design and taste of alternative cigarette mechanisms that seek to reduce the hazards of smoking. If safer designs are promoted, or at least not discouraged, by the government, and if safer products are purchased by consumers, companies will have a financial incentive to improve their products.

In the absence of official support from the public health community, R.J. Reynolds commissioned a wide range of medical studies to document the greater safety of the Premier cigarette. Perhaps most impressively, an advisory committee convened by the Emory University School of Medicine provided oversight of a series of studies assessing the hazards of the Premier cigarette.<sup>116</sup> Together, these studies thoroughly evaluated the design and methodology used in making the product.<sup>117</sup> As viewed by this committee, the cigarette design substantially achieved the stated objectives:

- To simplify the chemical composition of mainstream and side-stream smoke emitted by the new cigarette.
- To minimize the biological activity of the mainstream and side-stream smoke emitted by the new cigarette.
- To achieve significant reduction of environmental tobacco smoke from the new cigarette.<sup>118</sup>

The committee commended these objectives and concluded that they were substantially achieved through the research and development program.<sup>119</sup>

One of the many studies commissioned as part of this review involved the intake of tobacco smoke by animals. These tests supported the view that the new cigarettes were safer: "Although the studies were only of ninety-day duration they did clearly demonstrate the decrease in adverse biological activity from the new cigarette when compared to effects induced by smoke from reference cigarettes."<sup>120</sup>

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115. See Matthew L. Wald, *Cutoff Switches for Car Airbags Will be Allowed*, N.Y. TIMES, Nov. 18, 1997, at A1.

116. See RJR STUDIES, *supra* note 101, at vi, ix.

117. See *id.* at ix.

118. *Id.* at ix-x.

119. See *id.*

120. *Id.* at xii.

The committee's review of a study focusing on the presence of mutagens in human urine was similarly positive:

[The committee] agreed that the urine mutagenicity results showed a significant difference between persons smoking reference or new cigarettes, and no difference between nonsmokers and smokers of the new cigarette. The Committee also agreed with the conclusion that, as assessed subjectively by nonsmokers, there was a substantial reduction in the irritant properties of Environmental Tobacco Smoke produced by the new cigarette compared to that of reference cigarettes.<sup>121</sup>

Finally, the report addressed the potential toxicity of the ingredients in the new cigarette, concluding once again that the evidence supported the safety of the new cigarette design: "The information presented states that the new cigarette is manufactured from components having little or no toxicity."<sup>122</sup>

The carbon monoxide risks remained, so this product was not entirely risk-free. Moreover, these studies, even though undertaken by highly reputable medical researchers, may not resolve all scientific issues.<sup>123</sup> It is in this regard that the FDA could play a fundamental policy role. Rather than having a company commission a medical school to oversee a set of studies, the FDA could outline which types of studies might be useful for making precise inferences regarding a product's safety. In the case of new cigarette designs, such as the Premier, a two step approach might be desirable. First, the company could commission a series of studies, as was done with the Premier, and then the FDA could review the results of these studies. Based on this review, the FDA could establish guidelines for additional research that would need to be undertaken in order to draw sufficiently precise conclusions regarding the safety of the product.

The results of these studies in turn could be a part of the comparative risk rating of cigarettes and alternative cigarette designs. Again, such a rating system might include information beyond an overall risk figure. For example, pertinent dimensions might include cancer risk; carbon monoxide; environmental tobacco smoke; and

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121. *Id.* at xiii.

122. *Id.*

123. For example, these studies did not ascertain the long-term health risks from prolonged exposure to the product.

nicotine. One could also envision other sets of attributes that could be conveyed to consumers to assist in their choice.<sup>124</sup>

Ideally it would be helpful to undertake field experiments to determine how the provision of different kinds of information affects consumer risk beliefs and choices. The general spirit of these studies would be similar to those that I have undertaken with several former colleagues at Duke University.<sup>125</sup> We undertook these studies for the U.S. Environmental Protection Agency to provide them guidance in the labeling of pesticides and hazardous chemicals. What we found is that the structure and format of information greatly affected people's ability to process hazard warnings.<sup>126</sup> The content of information is consequently not the sole concern. Moreover, providing too much information can potentially be detrimental in that it can distract consumers' attention from the basic message, or can create problems of information overload.<sup>127</sup>

Oversimplifications, such as claiming that consumers cannot process hazard warning information, are certainly not correct. Similarly, the other extreme, the hypothesis that consumers perfectly process all information given to them and act upon this information, also is not true. However, there does exist a wide body of literature regarding the design of hazard warnings.<sup>128</sup> Through appropriately designed experimental tests of alternative warning approaches, it is possible to ascertain which structures of information work and which do not. Before embarking on a new risk rating policy for cigarettes, it would be valuable to undertake such experimental studies so that we could design the safety rating system to optimize its efficacy.

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124. For example, the government could develop an overall index of the risk of heart disease or other major consequences of smoking. Thus, it might be possible to develop a list of health outcomes of cigarettes, including possible addiction, and to rate the riskiness of different cigarettes with respect to these hazards. Note that a carbon monoxide listing would not do this, as carbon monoxide is a chemical exposure that leads to a potential outcome, rather than the outcome itself.

125. See VISCUSI & MAGAT, *LEARNING ABOUT RISK*, *supra* note 41; MAGAT & VISCUSI, *INFORMATIONAL APPROACHES TO REGULATION*, *supra* note 41. The results of these studies are reported throughout VISCUSI, *FATAL TRADEOFFS*, *supra* note 46.

126. See, e.g., MAGAT & VISCUSI, *INFORMATIONAL APPROACHES TO REGULATION*, *supra* note 41, at 16.

127. See *id.* at 14, 88-92, 103, 185-86.

128. See, e.g., MAGAT & VISCUSI, *INFORMATIONAL APPROACHES TO REGULATION*, *supra* note 41, at 107-18; VISCUSI & MAGAT, *LEARNING ABOUT RISK*, *supra* note 41, at 132-55.

## CONCLUSION

The most essential change that I am proposing in FDA policy is that it undertake a constructive role in fostering technological innovations to promote cigarette safety. Such a stance would require a shift in the attitude of the FDA toward the industry. The current attitude—the vehemently anti-cigarette stance—is reflected in the quest for a smoke-free society by the year 2000.<sup>129</sup> This kind of absolute objective is unachievable. What can be achieved, however, is a reduction in the hazards associated with smoking. Official estimates place the annual death total associated with cigarettes in the hundreds of thousands.<sup>130</sup> In light of these figures, the potential benefits from reducing risks of smoking are enormous.

The government's policy objectives should include the promotion of informed choices. If a person chooses to smoke, such choice should be based on a full understanding of the risks. The most beneficial role that the government could play would be to assist people in making informed choices. In particular, this would involve providing information regarding innovative safety features for cigarettes—an action that would assist consumers in decreasing the health hazards posed by smoking.

Adopting a stance that promotes the consumption of safer cigarettes will exploit perhaps the most powerful force in markets—consumer choice.<sup>131</sup> This century has witnessed a decline in many of the risks we face: motor vehicle accident death rates are down,<sup>132</sup> jobs are safer,<sup>133</sup> home accidents are down,<sup>134</sup> and environmental hazards are diminishing as well.<sup>135</sup> In economic terms, people have a strong income elasticity for good health. As we become richer, we value our health more. As a consequence, the increased affluence of the United

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129. Surgeon General C. Everett Koop popularized the idea of a smoke-free future. See, e.g., DHSS, REDUCING THE HEALTH CONSEQUENCES OF SMOKING, *supra* note 74, at vii; C. Everett Koop, *A smoke-free society by the year 2000*, 85 N.Y. ST. J. MED. 290-92 (1985).

130. See DHSS, REDUCING THE HEALTH CONSEQUENCES OF SMOKING, *supra* note 74, at 22 (estimating that over 300,000 people per year die from smoking).

131. Market forces consist of two elements: supply and demand. Consumer choice is the demand side of the market. Together with supply considerations, it determines market outcomes. For a review of consumer choice theory, see ANDREW MAS-COLELL ET AL., MICROECONOMIC THEORY 17-36 (1995). As noted therein: "The most fundamental decision unit of microeconomic theory is the consumer." *Id.* at 17.

132. See VISCUSI, FATAL TRADEOFFS, *supra* note 46, at 285.

133. See *id.*

134. See *id.*

135. See *id.* at 288.

States and its citizenry will increase the demand over time for safer cigarette products.

The dramatic reduction in cigarette tar levels reflected in Figure 1 illustrates the potential impact of market forces. People continue to smoke, though not at the same levels as at the peak of smoking rates. However, there has been a substantial downturn in the tar levels of cigarettes as consumers have sought safer cigarette options. Technological devices such as the Premier cigarette would simply exploit the consumer demand for safer products by matching safer cigarettes with the preferences of consumers who seek to reduce the risks of cigarettes.

Some people may be reluctant to adopt such an approach because it is not as uncompromising as a strict anti-smoking policy. But the objective of government policy should be to promote the health and welfare of the citizenry, not simply to restrict cigarette smoking *per se*. The current policy approach of failing to promote safer cigarettes, in effect, is using death as the principal deterrent to reduce smoking rates. While it is true that some people may choose to smoke safer cigarettes rather than to give up smoking altogether, the government should not be in the role of restricting technological devices that enhance safety and reduce the truly substantial risks of smoking. Government cigarette regulation would promote smokers' health if it were more supportive of such innovations than it has been to date.

Moreover, this policy approach would not exclude a policy concern for youth smoking, which has received such substantial attention in recent years.<sup>136</sup> Society restricts decisions by youths in many ways. States do not generally permit people to have drivers' licenses until age sixteen. There are minimum ages for voting, for joining the armed forces, and for seeing certain movies. We impose these restrictions because we want people to gain sufficient maturity to ensure that the decisions they make—which may have long-term consequences for their own lives or for the lives of others—will be sound. Promotion of safer cigarette designs is in no way inconsistent with the effort to discourage underage smoking and ultimately is based on a

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136. Youth smoking is a principal target of both the Proposed Resolution to the cigarette litigation and Senate Bill 1415, the Universal Tobacco Settlement Act, which includes penalties levied on the cigarette companies if smoking does not decrease sufficiently. See S. 1415, 105th Cong. § 201 (1997). Also see the discussion in Hersch, *supra* note 25, at 1140-42.

similar concern—the importance of informed choice in making decisions that pose potentially substantial long-term risks.

The approach the government has taken traditionally with respect to smoking hazards is to require placement of warnings on cigarette packages and on cigarette advertising. The Proposed Resolution of the cigarette litigation would expand the range of warnings further.<sup>137</sup> It is unlikely, however, that simply modifying the existing warnings will be effective. Although anti-smoking critics might assume that continued smoking must be attributable to ignorance of smoking's hazards, a detailed examination of a variety of risk perception measures indicate that this is not the case. Indeed, information that cigarette smoking is hazardous is almost universally known, and overall even smokers tend to *overestimate* rather than underestimate the risks of smoking.

This result does not imply, however, that there is no informational role for the government to play. The government's approach simply needs to be much more subtle and refined than that of disseminating variations on the old theme that smoking is a very risky pursuit. The informational strategy that I have advocated here is two-fold. First, the FDA should develop a ratings system to indicate the comparative riskiness of various types of cigarettes so that consumers can better match the hazardousness of particular cigarettes to their own preferences and their own health concerns. Second, the FDA should undertake a vigorous role in fostering the development of safer cigarette designs, in testing the efficacy of these new designs, in rating the safety properties of these innovations, and in disseminating information concerning these advances to consumers. Doing so will exploit the powerful forces of consumer choice that have led to the dramatic decline in tar levels in cigarettes over the past half century.

Would such an effort be effective in fostering safer decisions? The stark shift in the tar levels of cigarettes is perhaps the best evidence that it would. More generally, warnings are effective in altering behavior only when they convey new information in a convincing manner. If the FDA can develop a credible system for rating the comparative hazardousness of various types of cigarettes, and can provide consumers with a type of risk information that they do not currently have, then the Agency would be filling an informational void and could potentially assist consumers in making sound decisions.

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137. See *supra* tbl.2.

There are two prerequisites for success. First, the information must be new rather than simply a recycled variant on the familiar warnings. Second, it should be truthful and credible so that consumers can rely on this information when making their choices. The FDA is the most natural actor to engage in such an undertaking. The cigarette companies individually could attempt such informational efforts, but these initiatives would neither be as credible nor as effective as a government-sanctioned program. Moreover, to the extent that any such statements could be regarded as health claims for a company's product, the companies would be reluctant to risk regulatory sanctions for making such claims without FDA approval.

The idea of fostering safer cigarette designs is novel. Such a function has never been a component of the anti-smoking efforts of U.S. government agencies. This absence of a strong interest in fostering technological improvements to enhance cigarette safety stands in striking contrast to the regulatory approach that exists elsewhere throughout the health, safety, and environmental establishment. By expanding the range of policy tools that are being used to address the hazards of smoking, this effort would not only enhance the well-being of smokers, who would be able to make informed choices from an improved and expanded menu of options, but would also lead to potentially dramatic improvements in our national health.

