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CBO PAPER

THE PROPOSED TOBACCO SETTLEMENT: ISSUES FROM A FEDERAL PERSPECTIVE

April 1998

CONGRESSIONAL BUDGET OFFICE
SECOND AND D STREETS, S.W.
WASHINGTON, D.C. 20515

PREFACE

Last year, representatives of five major tobacco companies and a group of state attorneys general reached an agreement that, if enacted, could dramatically change the ways in which tobacco is marketed, sold, and consumed in the United States. That settlement would impose large payments on the tobacco industry, strengthen regulatory controls, and expand public health initiatives to reduce cigarette smoking. This Congressional Budget Office (CBO) paper--prepared at the request of the Assistant Majority Leader of the Senate--examines the settlement's potential impacts on consumers and the industry. The reduction in cigarette consumption and the amount of payments by the industry are estimated under various assumptions regarding increases in the price of cigarettes and the response by smokers to those price hikes.

The paper was written by Joseph Antos, Kathryn Rarick, Bruce Vavrichek, and Judith Wagner of CBO's Health and Human Resources Division. Julia Matson and Nabeel Alsalam carefully reviewed the underlying technical analysis for accuracy and consistency. A number of other people at CBO provided helpful comments and suggestions as part of the agency's internal review process. In addition, Robert Cook-Deegan of the National Academy of Sciences commented on portions of the paper.

Leah Mazade edited the manuscript, assisted by Melissa Burman. Ronald Moore and Sharon Corbin-Jallow prepared the paper for publication. Laurie Brown prepared the electronic version for CBO's World Wide Web site.

June E. O'Neill
Director

April 1998

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CHAPTER I
SUMMARY AND INTRODUCTION

On June 20, 1997, the tobacco industry reached a settlement with a number of state attorneys general who had brought suit against it. Under the agreement, tobacco companies would make substantial annual payments to state governments and others and would abide by many additional regulations, including restrictions on advertising, labeling, and access.

The settlement specifies payments of $368.5 billion (in 1998 dollars) over the next 25 years, assuming no change in tobacco consumption. If consumption fell, however, the industry's payments would be reduced proportionately.

In return, the agreement would place limits on future litigation against the industry and alter the Food and Drug Administration's (FDA's) authority to regulate tobacco products and smoking. Under the settlement's restrictions on litigation, no class action suits or suits by any government entity could be brought against the tobacco companies, and those companies would be immune from all punitive damage liability for past conduct. The settlement would allow only individuals to bring suits to recover compensatory damages (such as medical costs and lost wages) for past industry conduct and compensatory and punitive damages for future conduct.

Implementing the agreement would require federal legislation, at a minimum, to grant the promised legal immunity to the tobacco industry and, perhaps, to modify FDA policies.

The settlement targets the use of cigarettes and smokeless tobacco for reduction efforts.[1] Cigarettes account for most of the spending on tobacco products in the United States (see Box 1). This paper focuses on how the settlement might reduce cigarette consumption and estimates the amount of payments that the tobacco industry would make.

Initiatives to Reduce Smoking

The settlement would reduce cigarette consumption in two ways. It would set in place an array of regulatory and public health initiatives designed to limit the

1. Cigars, pipe tobacco, and other tobacco products are not included in the settlement.

BOX 1.
THE TOBACCO INDUSTRY

Tobacco is the basis for a multibillion-dollar industry that is dominated by a few large firms. Cigarettes account for over 90 percent of spending on tobacco products in the United States, and last year American consumers smoked about 24 billion packs. Smokeless tobacco, cigars, and pipe tobacco are also produced by the tobacco industry. In 1995, U.S. spending for all tobacco products totaled about $49 billion.

Five American companies--Philip Morris, R.J. Reynolds (a subsidiary of RJR Nabisco), Brown and Williamson (a subsidiary of B.A.T. Industries), Lorillard (a subsidiary of Loews), and Liggett--produce almost all of the cigarettes sold in the United States. Two companies, Philip Morris and R.J. Reynolds, account for more than 70 percent of industry sales. About 36 billion packs of cigarettes were produced by U.S. firms in 1997, with about 12 billion packs exported to other countries and about 280 million packs shipped to U.S. territories and to U.S. armed forces stationed overseas. The rest were consumed by domestic smokers. Cigarette revenues totaled about $46 billion in 1996.

Smokeless tobacco products are also produced by only five domestic manufacturers: U.S. Tobacco, Conwood, Pinkerton, National, and Swisher. Over 120 million pounds of chewing tobacco and snuff were produced in the United States in 1996; in 1995, smokeless tobacco companies posted revenues of $1.7 billion. Cigars and pipe tobacco are produced in a market that is less concentrated in a few companies. About 2.5 billion large cigars and cigarillos and 14.2 million pounds of pipe and roll-your-own tobacco were produced by U.S. companies in 1995.

The United States is the second largest tobacco producer in the world, falling well below China in total production. In 1996, tobacco was grown on over 124,000 U.S. farms, producing a crop valued at $2.9 billion. The Department of Agriculture administers a system of marketing quotas that supports the price of tobacco, as well as a loan program for tobacco producers. The quota system has no significant costs other than those of administration. Over time, the loan program is intended to pay for itself.

The tobacco industry supports over 600,000 jobs for people who produce and deliver tobacco products. In addition, 625,000 retail outlets distributed cigarettes and tobacco products in 1992. Convenience stores and gas stations sold about $12.7 billion in tobacco products that year, with vending machines adding $2 billion in sales.

marketing and use of cigarettes. The settlement would limit or ban many forms of advertising and promotion; restrict smoking in workplaces and public areas; ban sales to people under age 18; and fund a variety of smoking prevention and cessation programs, among other actions.

Those regulatory and public health interventions would lead to reductions in cigarette consumption if they were funded at the levels envisioned in the settlement. Most of the decline would result from the infusion of new funds into smoking cessation programs aimed at adults. A larger decline in teenage smoking might result from the restrictions on advertising by the industry and from smoking prevention programs funded under the settlement. However, because teenagers account for a very small fraction of total cigarette consumption, the impact of most regulatory and public health provisions on total consumption would be small, at least over the next several years.

The settlement would probably generate more significant reductions in cigarette consumption through its effect on the price of cigarettes. By requiring the tobacco industry to make substantial payments to state governments and others, the settlement would result in higher prices for cigarettes. Those payments would be unlikely to reach the $368.5 billion figure, however, since they would be reduced as the total consumption of cigarettes fell. Nonetheless, the industry would make substantial payments under the settlement and cigarette prices would be likely to increase significantly.

Considerable research supports the proposition that increasing the price of cigarettes would be the most effective way to reduce their use. Even so, there is considerable uncertainty about how the industry would change the price of cigarettes in response to the cost increases in the settlement. Some analysts believe that tobacco firms would attempt to "pass along" the cost increase--about 63 cents per pack--to consumers by raising cigarette prices commensurately. Other analysts believe that the pricing dynamics in the tobacco industry plus the settlement's lifting of some antitrust provisions would allow tobacco companies to raise prices by more than the cost increase, perhaps by as much as $1.50 per pack. A 63-cent increase in price would lead to significant reductions in smoking; a larger price increase would be even more effective.

The Likely Outcome

The widely cited $368.5 billion industry payment is based on the assumption that tobacco consumption will remain at its current level for the next 25 years. That outcome is highly unlikely, however. One obvious reason is that if the settlement is

enacted, its provisions will lead to lower consumption of tobacco and lower payments by the industry.

Even without the settlement, tobacco consumption would be likely to follow its downward trend of the past two decades. That trend reflects both changes in consumer preferences about smoking (perhaps because of a greater awareness on the part of the public of the link between smoking and health) and steadily rising retail prices. As a result, enactment of the settlement, along with anticipated declines in tobacco consumption that would occur in any event, could lead to large total reductions in cigarette consumption and industry payments well below $368.5 billion.

Considerable uncertainty exists about the extent of the decline in smoking that would occur in the absence of a settlement. This analysis considers an illustrative benchmark under which total consumption declines by about 16 percent over the 25-year period. That figure is consistent with a number of plausible scenarios about future declines in the popularity of smoking as well as hikes in state excise taxes and other factors that would increase the price of cigarettes. The benchmark assumes that roughly half of the payments the industry would make under the settlement would be paid to resolve outstanding lawsuits, even in the absence of federal legislation.

Measuring against that benchmark, CBO estimates that tobacco consumption would have declined by a total of 23 percent to 26 percent at the end of 25 years provided that the settlement was enacted with all of its regulatory and public health components and that it led to a 63-cent-per-pack increase in cigarette prices (in 1998 dollars). That drop in consumption includes a reduction of 16 percent that is assumed to occur in the absence of the settlement; thus, the incremental effect of the settlement would be to lower consumption by between 7 and 10 percentage points. Under a price increase of $1.50 per pack (in 1998 dollars), total consumption at the end of 25 years would have fallen by 32 percent to 45 percent--with an incremental impact of 16 to 29 percentage points attributable to the settlement.

Price Increase (Dollars per pack)	Changes in Consumption by the 25th Year (Percent)	Total Industry Payments (Billions of dollars)
.63	-23 to -26	288 to 298
1.50	-32 to -45	216 to 263

Lower total consumption of cigarettes would also imply lower industry payments; payments would total between $288 billion and $298 billion under the scenario of a 63-cent price increase.[2] The industry is assumed to have made a substantial payment even without a national settlement; thus, the incremental payment resulting from the settlement would be from $128 billion to $138 billion. Total payments under a $1.50 price-increase scenario would be between $216 billion and $263 billion, and incremental payments would be correspondingly lower.

Overall, on the basis of analyses of several potential price increases that could result from enactment of the settlement, it appears highly unlikely that industry payments would ever approach the $368.5 billion figure that is commonly cited. The shortfall in payments would occur because the fundamental goal of the legislation--to reduce cigarette consumption--would at least to some extent be met.

Reducing Teen Smoking and Other Considerations

Many public health officials believe that people who do not start smoking as teens are much less likely to pick up the habit as adults. As a result, even though teens account for only a small fraction of all cigarettes consumed in the United States, one of the major objectives of the settlement is to reduce the number of teens who smoke. The settlement establishes targets for reducing the percentage of teenagers who smoke on a daily basis and imposes additional payments on the industry if those goals are not met. Such reductions in smoking, however, are unlikely to occur. If prices were raised by 63 cents a pack, the goal of reducing the prevalence of daily smoking by 30 percent over the first five years could be achieved--but only under the most optimistic of assumptions. Even then, the more ambitious goals that the settlement specifies for later years would not be met.

Many other issues could also arise in drafting legislation to enact the settlement.

- The settlement would increase cigarette prices significantly, providing a strong financial incentive to engage in illicit black-market activities. Diligent enforcement efforts would be necessary to ensure the integrity of the tobacco market under those circumstances.

- Most analysts agree that higher prices are the single most effective way to discourage consumption of cigarettes. However, because the

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2 Those amounts represent payments that would be made by the industry and not the impact of those payments on federal or state budgets.

settlement would levy the scheduled payments on tobacco firms and allow any price increases to be determined in the market, the size of those price increases is uncertain. The price of cigarettes could be increased with somewhat greater certainty by imposing an additional federal excise tax that could yield tax receipts equivalent to the payments under the settlement. Under that approach, cigarette prices could rise by at least as much as the additional excise tax.

- Since the settlement would reduce the demand for cigarettes, people who depended on the tobacco industry for their livelihood could be adversely affected. The economic impact would be concentrated geographically in a few southeastern states, which account for the bulk of tobacco growing and manufacturing in the United States.

- The costs of Medicare, Medicaid, and other public health programs would be unlikely to change perceptibly in the near term as a result of the settlement, given that cost savings would be likely to accrue only over decades. If the settlement effectively curbed teen smoking and if that translated into permanently lower cigarette consumption as those people grew older, the long-run impact on tobacco-related health care costs could be significant.

CHAPTER II
THE CONTEXT OF THE PROPOSED SETTLEMENT

The federal government has long considered smoking to be an important public health issue. As early as 1967, the Surgeon General identified smoking as the leading preventable cause of disease and premature death in the United States.[1] According to public health agencies, over 85 percent of lung cancers and 30 percent of deaths from all types of cancer are associated with smoking. Smoking is also responsible for almost 20 percent of deaths resulting from cardiovascular disease.[2]

Trends in Cigarette Consumption by Adults and Teenagers

Because of the adverse health effects of cigarette smoking, public health agencies monitor trends in cigarette consumption closely. Adults (people age 18 and older) constitute over 90 percent of smokers in this country; however, much public concern focuses on underage smokers because most adult smokers begin smoking in their teens.[3]

Smoking by Adults. Adult cigarette consumption was highest during the 1960s when, averaged over all adults, consumption reached more than 4,200 cigarettes per person annually (see Figure 1). Perhaps in response to reports from the Surgeon General and changing attitudes about smoking more generally, per capita cigarette consumption began to taper off in the 1970s (notwithstanding a sizable reduction in the inflation-adjusted price of cigarettes). Between 1980 and 1993, that downward trend accelerated, with consumption falling by about 3 percent a year. Price increases during that period probably contributed to the decline, as the inflation-adjusted price of cigarettes increased by 80 percent.

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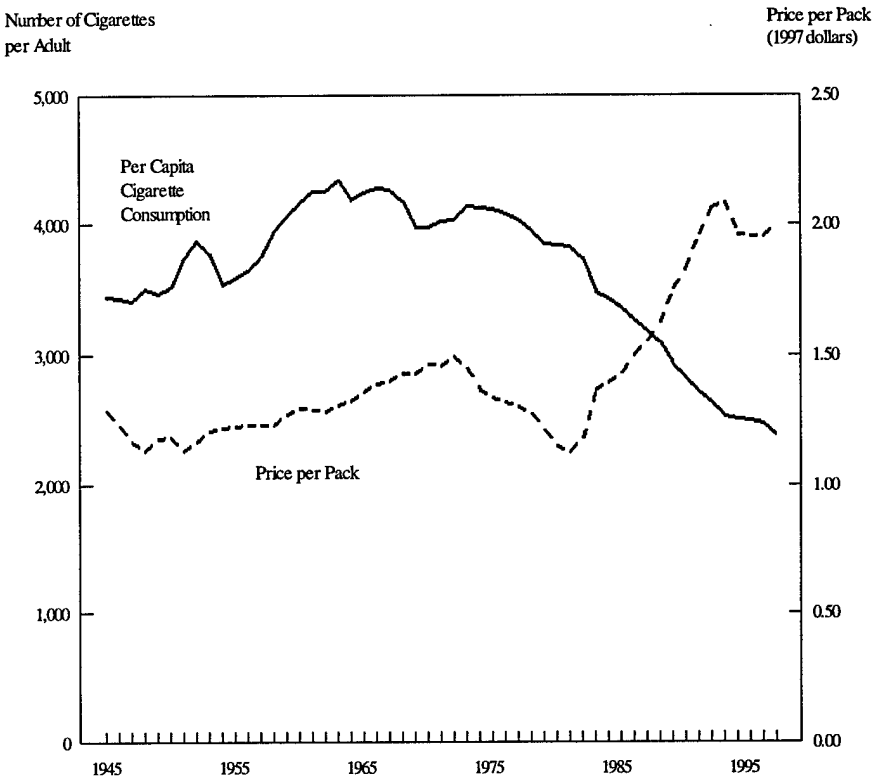
1. Office of the Surgeon General, *The Health Consequences of Smoking* (1967). The first Surgeon General's report linking smoking with lung cancer and other diseases appeared in 1964.

2. See Office of Technology Assessment, *Smoking-Related Deaths and Financial Costs: Estimates for 1990* (1993); Office of the Surgeon General, *Reducing the Health Consequences of Smoking: 25 Years of Progress* (1989), and *The Health Consequences of Smoking: Cancer* (1982); American Cancer Society, *Cancer Facts and Figures, 1993* (New York: ACS, 1993); and Carl E. Bartecchi and others, "The Human Costs of Tobacco Use (First of two parts)," *New England Journal of Medicine*, vol. 330, no. 13 (1994), p. 910.

3. Office of the Surgeon General, *Preventing Tobacco Use Among Young People* (1994).

FIGURE 1. TRENDS IN PER CAPITA ADULT CIGARETTE CONSUMPTION AND CIGARETTE PRICES, 1945-1997



SOURCE: Congressional Budget Office using data from the Bureau of Labor Statistics and the Economic Research Service of the Department of Agriculture.

Between 1994 and 1996, the drop in per capita consumption slowed, with only slight declines from the 1993 level in each of those years. That recent slow-down may have been attributable in part to price cuts in the early 1990s. Heightened competition between name-brand and generic cigarettes contributed to those price reductions.

Between 1996 and 1997, cigarette consumption resumed its earlier downward trend, falling by over 3 percent. The decline coincided with a return to larger price increases, as the inflation-adjusted price of cigarettes rose by 2.3 percent.

Other measures illustrate a similar pattern of long-term decline in the use of tobacco. Between 1965 and 1990, the percentage of adults in the United States who smoke fell from about 42 percent to 25.5 percent (see Table 1). Since then, smoking rates have hovered around 25 percent--representing nearly 50 million smokers.

The prevalence of smoking today is quite constant across various age groups of adults, with between 25 percent and 30 percent of people ages 18 to 64 being smokers. Only among those age 65 and older is the prevalence of smoking lower--at about 13 percent.

Smoking by Teenagers. Teenage smokers account for only 2 percent of all cigarettes consumed in the United States. Nonetheless, their smoking generates much concern since many public health officials believe that people who do not start smoking as teens are much less likely to pick up the habit as adults.

After a nearly 20-year decline, it may be that smoking by people under age 18 (termed "teenagers" in this analysis) has, in recent years, begun to rise. Researchers at the University of Michigan have tracked trends in teenage smoking using three different measures: smoking one or more cigarettes in the past month, smoking an average of one or more cigarettes per day in the past month, and smoking an average of 10 or more cigarettes per day in the past month. Using any of those measures, cigarette consumption by high school seniors began rising after 1992, following fairly steady declines between the late 1970s and early 1990s (see Figure 2). For example, the percentage of seniors who smoke an average of one or more cigarettes per day fell from 29 percent in 1976 to about 17 percent in 1992 and then rose to 22 percent in 1996.

The Cost of Smoking-Related Illnesses

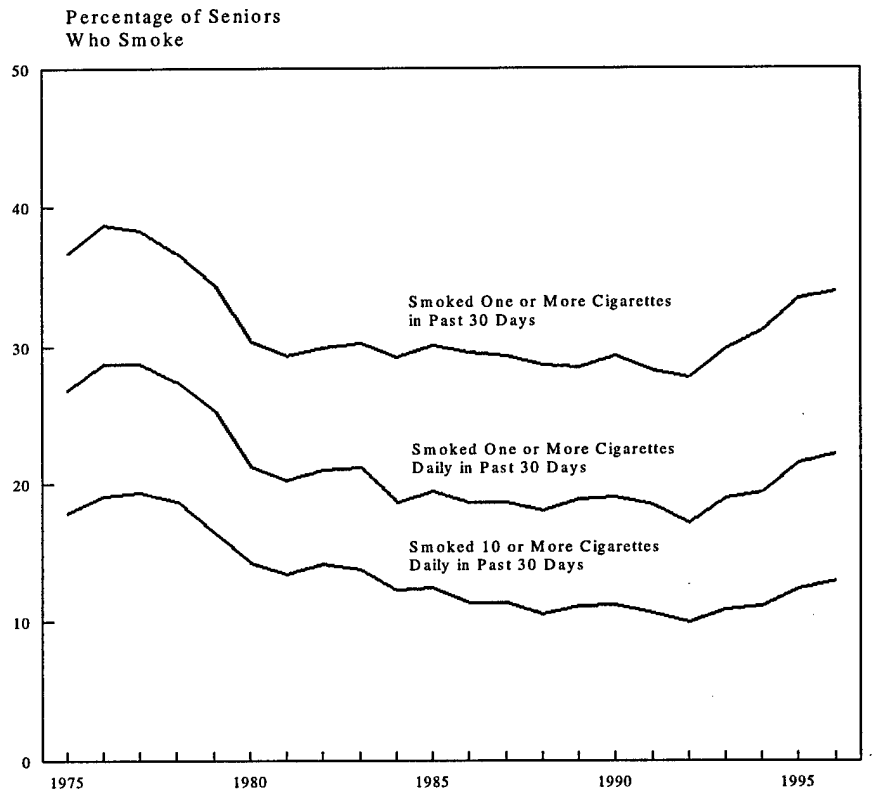
Many studies have examined the medical and other costs associated with smoking, but no firm conclusion has emerged about the net cost of smoking to society or to the

TABLE 1. PERCENTAGE OF ADULTS WHO WERE CURRENT SMOKERS, BY SEX AND AGE, 1965-1995

	1965	1980	1990	1995
Total Population	42.4	33.2	25.5	24.7
Sex				
Male	51.9	37.6	28.4	27.0
Female	33.9	29.3	22.8	22.6
Age				
18 to 24	45.5	33.3	24.5	24.8
25 to 44	51.2	37.8	29.7	28.6
45 to 64	41.6	35.6	27.0	25.5
65 and older	17.9	17.2	12.8	13.0

SOURCE: Congressional Budget Office using data from the Centers for Disease Control and Prevention, *Morbidity and Mortality Weekly Reports*, "Surveillance for Selected Tobacco Use Behaviors—United States, 1900-1994," vol. 43, no. SS-3 (November 18, 1994); and "Cigarette Smoking Among Adults—United States, 1995," vol. 46, no. 51 (December 26, 1997).

FIGURE 2. LONG-TERM TRENDS IN SMOKING FOR HIGH SCHOOL SENIORS, 1975-1996



SOURCE: Congressional Budget Office using data from the *Monitoring the Future Study* (Ann Arbor: University of Michigan, 1996).

federal government. Smoking probably increases the net costs of some federal programs, but it decreases the costs of others.

Smoking-related illnesses lead to increases in spending for federal health care programs, including Medicare, Medicaid, and veterans' health care. To the extent that an illness first occurs during a smoker's working years, smoking-related illnesses also contribute to increased outlays in Social Security's Disability Insurance program. The higher incidence of disability among smokers along with their shorter life spans relative to nonsmokers also reduces smokers' payments of payroll taxes.

Because of shorter life spans, however, the average smoker receives Medicare and Social Security retirement benefits for fewer years than does the average nonsmoker. In addition, smokers pay federal and state excise taxes on cigarettes. In 1997, the federal tax was 24 cents per pack and generated $6 billion in revenue. That same year, state excise taxes averaged 35 cents per pack and brought in about $8 billion in revenue.

Two methods typically used by researchers to estimate the costs of smoking are the prevalence-based method and the life-cycle method. The prevalence-based method estimates the costs of smoking that are incurred over a specific period (usually a year) by calculating the average difference in costs between smokers and nonsmokers in a given population. The life-cycle method makes a similar comparison over the lifetimes of smokers and nonsmokers.

In general, the two methods reach different conclusions about the net costs of smoking because smokers, on average, have shorter life spans than nonsmokers. By comparing the costs of only *living* smokers and nonsmokers, the prevalence-based method does not include either the avoided costs or lost tax revenue from smokers in years in which they are no longer alive. In contrast, the life-cycle method accounts for the shorter life spans of smokers relative to nonsmokers.

Prevalence-Based Estimates. Plaintiffs in the state suits against tobacco manufacturers used the prevalence-based method to estimate the costs of smoking for Medicaid and other state-funded health care programs. They estimated that the total cost of smoking for Medicaid was about $13 billion in 1993.[4] The federal share of that cost would be about $7 billion per year.

According to another study, the federal cost of smoking in 1993 also included about $10 billion for Medicare and $5 billion for other federal health care programs

4. Leonard S. Miller and others, "State Estimates of Medicaid Expenditures Attributable to Cigarette Smoking, Fiscal Year 1993," *Public Health Reports*, vol. 113 (March/April 1998).

such as veterans' health care.[5] Some prevalence-based studies also estimate the indirect costs, such as lost wages, from smoking-related morbidity and mortality, but those costs do not directly affect the federal budget.

A recent report by the Treasury Department estimates that the net medical costs of smoking total about $45 billion a year.[6] Those costs include federal, state, and private expenditures.

Life-Cycle Estimates. Studies that use the life-cycle method are more varied than prevalence-based studies in their conclusions. Two major analyses found that the total medical costs of smokers over their lifetimes were from 18 percent to about 28 percent higher than the lifetime medical costs of nonsmokers.[7] Those estimates suggest that despite their shorter life spans, smokers impose greater costs on federal health care programs than do nonsmokers.

Yet other studies have concluded the opposite---that nonsmokers have higher lifetime medical costs. However, their results may not be reliable, in part because they used data from other countries that may have patterns of smoking or health care systems that are different from those in the United States (see the appendix for further discussion).

A life-cycle study by Manning and others estimated the health care and other costs of smokers. One estimate grouped together private and public pension benefits, Social Security payments, veterans' compensation, and other public payments. The study concluded that over their lifetimes, smokers received about 9 percent less of such income than did nonsmokers. The Manning team's study also looked at how much smokers and nonsmokers paid in earnings-related taxes. It found that smokers paid about 2 percent less in those taxes than did nonsmokers as a result of their shorter life spans and higher incidence of disability.

When the excess medical costs of smokers were taken into account, Manning found that the net costs of smoking that were not paid directly by smokers or their families were equivalent to 33 cents per pack of cigarettes (in 1995 dollars). That cost is well below the combined federal and average state excise taxes of about 56 cents per pack. But those who are paying extra costs because of smoking-related

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5. Centers for Disease Control and Prevention, "Medical-Care Expenditures Attributable to Cigarette Smoking--United States, 1993," *Morbidity and Mortality Weekly Report*, vol. 43, no. 26 (1994).

6. Department of the Treasury *The Economic Costs of Smoking in the United States and the Benefits of Comprehensive Tobacco Legislation* (March 1998).

7. Willard G. Manning and others, *The Costs of Poor Health Habits* (Cambridge, Mass.: Harvard University Press, 1991); and Thomas A. Hodgson, "Cigarette Smoking and Lifetime Medical Expenditures," *Milbank Quarterly*, vol. 70, no. 1 (1992).

illnesses are not necessarily being fully compensated for the costs. For example, although smoking reduces the costs of some benefits such as pensions, the benefit plans that receive such savings generally do not also pay the additional costs that result from smoking. Similarly, the revenue from excise taxes on cigarettes is not directly distributed to entities, such as private health plans, that incur the greatest additional costs of smoking.

The Regulatory Context of the Settlement

To reduce the impact of smoking in the United States, both the state and federal governments have attempted to regulate the production, sale, and consumption of tobacco products. In many ways, the states have taken the lead in those actions. All states, for instance, have passed laws banning the sale of cigarettes to young people, and many states restrict or prohibit smoking at work sites.

More recently, tobacco products themselves have become the subject of increasing federal regulation. In 1995, the Food and Drug Administration began efforts to regulate nicotine as a drug and tobacco products as drug delivery devices. The agency used evidence of the pharmacological effects of nicotine on the body and manufacturers' control of the level of nicotine in cigarettes as proof that nicotine fit its definition of a drug. According to the FDA, a drug is a substance (other than food) intended to affect the structure or function of the body. The agency claims that manufacturers intend cigarettes to have a calculated physical effect on smokers through the use and control of nicotine levels.

In August 1996, the FDA finalized a series of regulations that would limit promotional activities by the tobacco industry and impose additional labeling requirements and access restrictions on its products. Those regulations were based on the FDA's authority over medical devices. If it had applied its drug authority, manufacturers would have had to remove cigarettes from the market unless they could demonstrate their product's safety and efficacy.

The tobacco industry sued the FDA, but in April 1997, a U.S. District Court ruled that the agency could define nicotine as a drug and tobacco products as drug delivery devices. However, the court further ruled that the FDA could not regulate the advertising and promotion of tobacco products. The FDA's proposed restrictions on the sale and labeling of tobacco products were upheld. Both the FDA and the tobacco industry have appealed the court's decisions.

State and Private Lawsuits

Apart from its regulatory battles, the tobacco industry has also had to face increased legal challenges on other fronts. Until recently, tobacco companies had never paid damages to any plaintiff in a lawsuit. Tobacco companies have successfully claimed that the alleged harmful effects and addictive nature of tobacco have never been proven.[8] Moreover, the 1965 Federal Cigarette Labeling and Advertising Act, which requires warning labels on all cigarette packages, has actually aided the tobacco companies in their defense. Because the federal government required those labels, tobacco companies have invoked an "assumption of risk" defense, arguing that consumers have been adequately warned of any risks that may be associated with smoking. As long as the companies comply with the law, they maintain that no additional information regarding the safety of their products need be supplied. That defense so far has been effective in defeating plaintiffs' claims based on a "failure to warn"--that is, that they were not adequately warned of the dangers of cigarette smoking.

However, the changing nature of the cases brought against the tobacco industry and the uncovering of new evidence suggest that the outcome of future lawsuits may be less certain. Although individual and class action suits against tobacco companies based on a "failure to warn" have been preempted by the law requiring warning labels, the Supreme Court ruled in 1992 that that law would not preempt suits based on a "duty to disclose." Therefore, a plaintiff can bring an action against a tobacco company for failing to test or research its products adequately or for failing to divulge test results.[9]

That ruling helped to create an opening for state governments to sue tobacco companies to recover costs associated with the treatment of tobacco-related illnesses. States have argued that tobacco companies have conspired to suppress research, manipulated nicotine levels in their products, and targeted sales toward minors. Not only are those lawsuits allowable under the Supreme Court's ruling but states have an advantage over individual litigants because they are not hampered by "assumption of risk" defenses. (Because the state governments never chose to consume tobacco products, the companies cannot claim that they, through a deliberate and informed choice, assumed the financial risks involved with using tobacco products.) Although the approaches of the states that have filed lawsuits vary, the legal advantages noted above have allowed them to argue that they should be compensated for Medicaid and other spending on the cigarette-related illnesses of their residents.

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8. Mark Hansen, "Capitol Offensives," *American Bar Association Journal* (January 1997).

9. K. E. Meade, "Breaking Through the Tobacco Industry's Smokescreen: State Lawsuits for Reimbursement of Medical Expenses," *Journal of Legal Medicine*, vol. 17 (1996).

The Proposed Settlement

With those events as backdrop, representatives of the tobacco industry and a number of state attorneys general reached an agreement in June 1997 that could dramatically change the landscape of tobacco production, marketing, sales, and consumption in the United States. Provisions of the settlement would affect tobacco manufacturers, sellers of tobacco products, consumers, states, federal agencies, and other entities.

Under the settlement, tobacco manufacturers would face restrictions on advertising and promotion of tobacco products and would be subject to FDA regulation of their products. Cigarette retailers would have to be licensed, would be allowed to sell only to adults, and would be subject to rules about where they placed tobacco products in their outlets. Employers, fast-food restaurants, and some other establishments would have to create smoke-free environments. The right of consumers to sue tobacco companies for past damages would be substantially limited.

Tobacco manufacturers would be assessed annual payments based on total domestic sales for as long as they sold tobacco products in the United States. If sales remained at current levels, those fees would total $368.5 billion (in 1998 dollars) over the next 25 years; annual payments would rise during the first few years until they reached $15 billion per year, where they would remain (see Table 2). If total consumption fell in future years, the payment due in each year would be reduced proportionately. The manufacturers would be at risk for additional payments--up to $2 billion per year--if the prevalence of daily smoking among teenagers did not decline by the amounts specified in the settlement.

The payments obtained from the manufacturers would be distributed for a variety of purposes. Of the reported $368.5 billion in payments scheduled over 25 years:

- About $193 billion would be distributed among all 50 states as compensation for past and future tobacco-related costs;
- About $77 billion would be used by the tobacco industry to pay for judgments and settlements it would make related to private suits that would continue under the settlement;
- $73 billion would pay for smoking cessation programs, state and local enforcement of laws restricting access to tobacco, antitobacco media campaigns, and other smoking prevention programs; and

TABLE 2. SCHEDULED TOBACCO INDUSTRY PAYMENTS FOR THE FIRST 25 YEARS UNDER THE PROPOSED SETTLEMENT

End of Year in Which Payment is Due	Scheduled Industry Payment (Billions of 1998 dollars)
Immediately	10.0
1	8.5
2	9.5
3	11.5
4	14.0
5	15.0
6	15.0
7	15.0
8	15.0
9	15.0
10	15.0
11	15.0
12	15.0
13	15.0
14	15.0
15	15.0
16	15.0
17	15.0
18	15.0
19	15.0
20	15.0
21	15.0
22	15.0
23	15.0
24	15.0
25	15.0
	368.5

SOURCE: Congressional Budget Office based on the settlement document, "Proposed Resolution," released June 20, 1997.

- o $25 billion would finance a trust fund to carry out tobacco-related medical research.

The federal government would receive the $25 billion in research funds. It would also control the use of the $73 billion in public health-related funding, presumably passing most of the money along to the states for enforcement, prevention, and cessation programs.

CHAPTER III
THE IMPACT OF REGULATORY AND PUBLIC HEALTH PROVISIONS

The settlement proposes two main categories of provisions that are intended to reduce tobacco consumption, especially by young people. The first category comprises regulatory and public health policies designed to limit the marketing and use of cigarettes. The second category is composed of monetary payments and penalties imposed on tobacco manufacturers. Those payments are intended to reduce smoking by both raising the price of cigarettes and funding federal and state smoking prevention and cessation programs. This chapter analyzes the potential impact of the first category of policies, those affecting the marketing and use of cigarettes.

The settlement's impact on tobacco consumption would depend not only on the individual effects of its particular provisions and the details of their implementation but also on their mutually reinforcing or offsetting effects if adopted as a package. The array of provisions in the settlement has never been implemented in any jurisdiction. Thus, evidence on the effects of past or present efforts to control the use of tobacco can provide only rough guidance about the potential direction and magnitude of the settlement's effects.

As discussed earlier, the settlement's terms would not be imposed on a blank slate: federal, state, and local regulations already restrict labeling, advertising, promotion, and access. The net effect of the settlement on consumption would depend on how much more restrictive its terms are than the limitations that make up the status quo. On the one hand, the most restrictive settlement clause would have no impact if it merely codified already universal state or federal policy. On the other hand, the settlement could make already existing restrictions more effective if their previously uneven application across jurisdictions had made them easy to circumvent or difficult to enforce. Thus, any analysis of the impacts expected from the settlement must examine how its provisions change the already existing framework of tobacco controls.

The regulatory and public health provisions in the settlement cover five areas:

- Advertising, Promotion, and Labeling. The settlement would ban outdoor advertisements such as billboards, limit advertising content in print media geared to children, ban event sponsorship, require prominent warnings on packages and advertisements, ban advertising on the Internet, limit the size and number of point-of-purchase

advertisements, and prohibit certain other promotional formats. (TV and radio advertising for tobacco products has been banned by federal law for many years.)

- o Public and Workplace Restrictions. The settlement would restrict the use of tobacco in workplaces, fast-food restaurants, and other public places to separately ventilated areas. It would not restrict use in other restaurants, casinos, bingo parlors, bars, and certain other locales.

- o Youth-Access Restrictions. The settlement would ban sales to people under the age of 18 and require retailers, who would be subject to state licensure, to check for proof of age. Sales of cigarettes from vending machines would also be banned.

- o Smoking Prevention and Cessation. The settlement would earmark funds for smoking cessation programs, public education and counteradvertising programs, and state and local tobacco-control efforts.

- o Regulation of the Content of Tobacco Products. Under the settlement, all nontobacco ingredients in tobacco products would have to meet Food and Drug Administration safety standards. The FDA could also require manufacturers to remove harmful ingredients and reduce nicotine levels, but only if it could show substantive evidence that such changes would reduce health risks, be technologically feasible, and not create a significant black market for unregulated tobacco products.

These terms would exceed currently enforced federal and state restrictions on advertising, promotion, labeling, and youth access (see Table 3).

The provisions regarding the FDA could ultimately affect tobacco consumption, but the FDA's authority to regulate the content of tobacco products is uncertain. That issue is now before the courts. As a result, neither the magnitude nor the direction of the settlement's provisions relating to the FDA is clear, and this paper does not attempt to quantify them.

Overall, the Congressional Budget Office (CBO) finds that if the regulatory and public health interventions were funded at the levels envisioned in the settlement, smoking rates among adults might decline somewhat and rates among teens might drop to a greater extent. Although most of the individual regulatory and public health components of the settlement would be expected to have a small impact on cigarette consumption, together they constitute a package of mutually reinforcing interventions

TABLE 3. RESTRICTIONS ON THE ADVERTISING, PROMOTION, AND SALE OF CIGARETTES IN THE PROPOSED SETTLEMENT AND IN STATE AND FEDERAL LAWS, 1995

Settlement Provision	Number of States with Comparable Laws[a]	Federal Law or Regulation in Effect?	Comments
Ban Sales to People Under Age 18	51	Yes	Three states ban sales to those under age 19; one state bans sales to those under age 21.
License Retailers	34	No	
Ban Vending Machines	0	No	34 states restrict placement or require supervision to discourage access by underage people.
Prohibit Smoking in All Indoor Work Sites Except for Specially Ventilated Areas	21	Smoking banned in federal executive branch work sites	21 states restrict smoking in private work sites; 41 states restrict smoking at state government work sites.
Prohibit Smoking in Public Places, Except for Specially Ventilated Areas (Certain restaurants, bars, and other locales are exempted)	b	Smoking banned on scheduled domestic flights lasting six hours or less	
Restrict Advertising and Promotion	0	Federal ban on television and radio advertising	Federal law preempts state and local laws.

SOURCE: Congressional Budget Office using information from the Centers for Disease Control and Prevention.

NOTE: This table does not include regulations by local governments.

a. Includes the District of Columbia.
b. Information not available.

that could modestly accelerate a downward trend in smoking. Because teenagers account for only a small fraction of total cigarette consumption, the effect of most youth-oriented interventions on total consumption would be small over the next several years. The public health component of the settlement that could have the greatest chance of altering the smoking patterns of adults is the large infusion of funds to support smoking cessation programs.

Effects of Advertising Restrictions

The tobacco industry spent $5.1 billion for domestic advertising and promotional activities in 1996.[1] The settlement would place no restrictions on aggregate industry spending for advertising and promotion, but it would cut off several venues that are currently used by tobacco companies to market their products. For example, 20 percent of the industry's expenditures for domestic advertising and promotion in 1996 went to outdoor advertising, specialty item distribution, and public entertainment, all of which would be eliminated under the settlement. Other forms of advertising and promotion, which account for an additional 12 percent of spending, would be restricted. Roughly 68 percent of all advertising and promotional expenditures in 1996 went for promotional allowances, coupons, and value-added programs, which would not be restricted by the settlement. The net effect of the restrictions on total advertising and promotional activity would depend on the extent to which firms diverted funds to still unrestricted modes of advertising and promotion.[2]

If the tobacco industry did reduce its advertising and promotional activities, the greatest effect would probably be among teens. Evidence on teen responsiveness to advertising is somewhat sketchy. Studies have shown that teenagers are more sensitive than adults to brand-specific advertising.[3] In a recent study of the impact of brand-specific advertising expenditures on the market share of a typical brand, each 10 percent increase in advertising increased the brand's market share by about 3 percent among adults and 9 percent among teenagers.[4] Thus, when it comes to market share, advertising and promotion make a difference, particularly with young smokers.

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1. Federal Trade Commission, *Report to Congress for 1996* (1998).

2. Federal Trade Commission, *Competition and the Financial Impact of the Proposed Tobacco Settlement* (1997).

3. J. J. Boddewyn, "Tobacco Advertising in a Free Society," in Robert D. Tollison, ed., *Smoking and Society* (Lexington, Mass.: Lexington Books, 1986), pp. 309-332; and John Jenkins, "Tobacco Advertising and Children: Some Canadian Findings," *International Journal of Advertising*, vol. 7, no. 4 (1988), pp. 357-367.

4. Richard Pollay and others, "The Last Straw? Cigarette Advertising and Realized Market Shares Among Youths and Adults, 1979-1993," *Journal of Marketing*, vol. 60 (April 1996), pp. 1-16.

Yet the critical issue with respect to the settlement is not whether advertising and promotion can affect the market share of a given brand but whether they would influence overall consumption among adults and youth. Here, the evidence is much more equivocal. One systematic review of economic studies found overall support for a positive impact of aggregate advertising and promotional expenditures on tobacco consumption. But that effect was small: the change in cigarette consumption was on the order of 0.7 percent for each 10 percent increase in advertising.[5] A low estimated sensitivity does not, however, necessarily imply that a large industrywide reduction in spending (or a total ban) on advertising and promotion would have little effect on consumption.[6]

Given the greater responsiveness of teens to brand-specific advertising, the settlement's advertising restrictions would be likely to affect cigarette consumption by teens more than the total consumption of cigarettes by all groups. Specifically, the settlement would restrict the kinds of advertising that children and adolescents pay the most attention to and that positively influence their perceptions of smoking and their brand recognition.[7] It would seem reasonable, therefore, to expect the restrictions on advertising and promotion in the settlement to reduce teenage cigarette consumption by a modest but measurable amount compared with the status quo--provided that manufacturers do not find and adopt new and equally effective but unrestricted ways to reach that audience. If the restrictions reduced advertising and promotional expenditures by 15 percent, one might expect a reduction in consumption by teenagers of 1.5 percent or more.

Effects of Public and Workplace Restrictions

The settlement's restrictions on smoking in public areas and in the workplace would establish a national floor for existing requirements. Many states already restrict smoking in work sites or public places. Numerous local governments also restrict smoking in public places, and employers have increasingly adopted restrictions on smoking independent of local, state, or federal regulations.[8] The settlement's call for

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5. Rick L. Andrews and George R. Franke, "The Determinants of Cigarette Consumption: A Meta-Analysis," *Journal of Public Policy and Marketing*, vol. 10, no. 1 (1991).

6. Tobacco firms that advertised optimally, in the economics sense, would increase their spending on ads up to the point where additional advertising would have relatively little effect on sales. Thus, small reductions in spending on advertising might have little effect on consumption, but that does not mean that large reductions would be similarly ineffective.

7. Barbara S. Lynch and Richard J. Bonnie, eds., *Growing Up Tobacco Free: Preventing Nicotine Addiction in Children and Youths* (Washington, D.C.: National Academy Press, 1994).

8. National Cancer Institute, *Major Local Tobacco Control Ordinances in the United States,* NIH Publication 93-3532 (May 1993); and William N. Evans, Matthew C. Farrelly, and Edward Montgomery, "Do Workplace Smoking Bans Reduce Smoking?" (working paper, National Cancer Institute and the Robert Wood Johnson Foundation, June

a separate ventilation system implies costly remodeling, however, which could lead many employers to ban smoking altogether rather than adapt the workplace to accommodate the settlement's terms. The settlement would not preempt state and local governments from establishing or enforcing more stringent restrictions on smoking in public places or work sites.

Workplace smoking bans are among the most effective methods for reducing adult smoking.[9] The percentage of workers who are subject to bans on smoking in their work areas increased from 25 percent in 1985 to 70 percent in 1993.[10] One study found that workplace smoking bans reduced indoor workers' rates of smoking by between 5 and 6 percentage points, after controlling for differences in cigarette prices, demographic factors, and employees' self-selection of work sites consistent with their smoking behavior.[11] Average daily consumption by all workers (including smokers and nonsmokers) is about 1.4 to 2.5 fewer cigarettes at work sites that ban smoking in the work area compared with those that do not. However, given the already high prevalence of such bans and their irrelevance for the one-third of workers who work outdoors or are self-employed, the settlement's restrictions are likely to have a very small independent influence on total consumption.

Evidence on the effectiveness of restrictions on smoking in other public places is mixed, but such restrictions may reduce total consumption by both adults and young people.[12] Because the settlement would not restrict smoking in restaurants (other than fast-food establishments), bars, and certain other locales, even those effects would be attenuated. Thus, although it is reasonable to assume that each additional restriction on legal smoking environments would reduce consumption, the net effect of restrictions related to public places is likely to be small.

1997).

9. Tracey J. Woodruff and others, "Lower Levels of Cigarette Consumption Found in Smoke-Free Workplaces in California," *Archives of Internal Medicine*, vol. 153 (June 28, 1993), pp. 1485-1493; and F. A. Stillman and others, "Ending Smoking at the Johns Hopkins Medical Institutions: An Evaluation of Smoking Prevalence and Indoor Air Pollution," *Journal of the American Medical Association*, vol. 264 (1990), pp. 1565-1569.

10. Evans, Farrelly, and Montgomery, "Do Workplace Smoking Bans Reduce Smoking?"

11. Ibid.

12. Frank J. Chaloupka and Michael Grossman, *Price, Tobacco Control Policies and Youth Smoking*, Working Paper No. 5740 (Cambridge, Mass.: National Bureau of Economic Research, September 1996).

Effects of Restrictions on Youth Access to Cigarettes

The settlement essentially codifies existing laws in the 50 states and the District of Columbia banning sales to minors. It also includes the requirement that retailers obtain proof of age for anyone under 27, which is part of the 1996 FDA rule as well. Retailers' compliance with state laws has been an issue, however, and vigorous inspection programs appear to increase such compliance substantially.[13] But the evidence is inconclusive regarding how much the programs reduce smoking by teens.

A 1990 study estimated that about three-fourths of all tobacco outlets sold tobacco to minors, and a 1992 report indicated that only two states were actively enforcing their youth-access laws.[14] Vigorous enforcement can achieve compliance rates of 90 percent or more, and studies in two communities that have undertaken such enforcement report drops in teenage smoking when those high compliance rates are achieved.[15] But those studies did not control for other factors that may have affected smoking rates.

A recent study of youth-access restrictions in Massachusetts compared three communities that vigorously enforced retailer compliance with three similar communities that did not. Researchers found that although vigorous enforcement increased retailer compliance from 32 percent to 82 percent over two years in the experimental communities, that feat had virtually no impact on tobacco use among teenagers.[16] Rates of use were largely unchanged over the study period in both the experimental and control communities. Surveys of teens in the experimental communities did reveal a shift in their sources of cigarettes: instead of obtaining cigarettes from community retailers, teens began to buy them from retailers outside the jurisdiction or to acquire them indirectly through third parties, such as older friends and relatives.

Despite the questionable effectiveness of youth-access restrictions, public health advocates argue for their use because of their symbolic and educational

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13. Nancy A. Rigotti and others, "The Effect of Enforcing Tobacco Sales Laws on Adolescents' Access to Tobacco and Smoking Behavior," *New England Journal of Medicine*, vol. 337, no. 15 (October 9, 1997), pp. 1044-1051.

14. J. R. DiFranza and J. Tye, "Who Profits from Tobacco Sales to Children?" *Journal of the American Medical Association*, vol. 263, no. 20 (1990), pp. 2784-2787; and Office of the Inspector General, Department of Health and Human Services, *Youth Access to Tobacco* (1992).

15. L. A. Jason and others, "Active Enforcement of Cigarette Laws in the Prevention of Cigarette Sales to Minors," *Journal of the American Medical Association*, vol. 266 (1991), pp. 3159-3161; and J. R. DiFranza, R. R. Carlson, and R. E. Caisse, "Reducing Youth Access to Tobacco," *Tobacco Control*, vol. 1, no. 58 (1992).

16. Rigotti and others, "The Effect of Enforcing Tobacco Sales Laws."

impacts and their capacity to shape young people's attitudes and beliefs.[17] By itself, this provision of the settlement would be unlikely to have much of an impact on consumption among teenagers.

Effects of Smoking Prevention and Cessation Programs

The settlement would allocate up to $1 billion per year in the first four years, and afterward $1.5 billion annually, for smoking prevention and tobacco-control activities, including public education, media campaigns, and FDA enforcement. As much as $1 billion to $1.5 billion more would be earmarked for smoking cessation efforts, including funding of cessation programs and devices to assist people wishing to quit.[18] That level of spending on smoking prevention, control, and cessation would be unprecedented. By comparison, spending by all states on tobacco control, including funds dispersed to states by federal programs for the purpose, was about $262 million in 1995.[19]

A consensus has emerged in the public health community that comprehensive and sustained action at the local level on a variety of fronts--including school-based education, media interventions, and community enforcement of antismoking norms--provides the best chance of preventing smoking among young people.[20] But the empirical evidence on the effectiveness of those measures is thin. A 1994 Surgeon General's report reviewing the effectiveness of school-based educational and media interventions undertaken in the 1980s and early 1990s found that no program demonstrated sustained reductions in smoking rates after six years of follow-up, although some programs delayed the initiation of smoking among young teenagers.[21] School-based smoking prevention programs have had modest impacts even in the short run--on the order of a 5 percent reduction in smoking prevalence one year after the intervention.[22]

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17. Lynch and Bonnie, *Growing Up Tobacco Free.*

18. The amount of money ultimately allocated to those efforts would be reduced proportionately if consumption declined over the course of the settlement. Supporting documents prepared by the state attorneys general pursuant to the settlement suggest that any reduction in payments be distributed proportionately across all uses. The one exception would be the $25 billion public health trust fund established to fund tobacco-related medical research, which would not be reduced.

19. Unpublished data from the Centers for Disease Control and Prevention, March 1998.

20. Office of the Surgeon General, *Preventing Tobacco Use Among Young People*; and G. A. Giovino and others, "Epidemiology of Tobacco Use and Dependence," *Epidemiology Reviews*, vol. 17, no. 1 (1995), pp. 48-65.

21. Office of the Surgeon General, *Preventing Tobacco Use Among Young People.*

22. Brenda Rooney and David Murray, "A Meta-Analysis of Smoking Prevention Programs After Adjustment for Errors in the Unit of Analysis," *Health Education Quarterly*, vol. 21, no. 1 (February 1996), pp. 48-64; and Thomas J. Glynn, "Essential Elements of School-Based Smoking Prevention Programs," *Journal of School Health*, vol. 59, no. 5 (May 1989), pp. 181-188.

Recently, some experimental, school-based approaches to the prevention of tobacco and drug abuse have shown promise. One program that taught 7th- and 8th-graders "life skills" and methods for resisting social influences yielded reductions in tobacco and drug use by students that persisted up to six years from the beginning of the program.[23] In addition, evidence suggests that school-based programs are more effective when reinforced with mass media campaigns.[24]

Smoking cessation programs targeted toward adults have been shown to significantly increase the rates at which individuals who are willing to stop smoking do so, although those rates depend on the intensiveness (and hence costliness) of the intervention. In particular, nicotine replacement therapy seems to be quite effective.[25] Such results indicate that for those people who are motivated to stop smoking, clinical cessation interventions can make a difference.

The availability of funds from the settlement could increase the effectiveness of smoking cessation programs in two ways. First, more pervasive and better-designed media campaigns could encourage more smokers to consider quitting. In California, for example, about 40 percent of smokers who stopped smoking during a state-sponsored media campaign cited an antismoking advertisement as a factor in their decision.[26] Second, subsidizing cessation programs would also reduce the cost of quitting for some people. The most intensive treatments involve use of a nicotine patch and clinical counseling. In 1995, the cost of the patch alone was about $200, and the full cost of treatment was over $350. A significant portion of those costs for some smokers could be defrayed through funds provided by the settlement.

Today, 16 percent to 18 percent of all smokers are willing to quit in any given year, but only about 5 percent of all smokers stop smoking on their own for at least

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23. Gilbert J. Botvin and others, "Long-Term Follow-Up Results of a Randomized Drug Abuse Prevention Trial in a White Middle-Class Population," *Journal of the American Medical Association*, vol. 273, no. 14 (April 12, 1995), pp. 1106-1112.

24. B. Flynn and others, "Long-Term Responses of Higher and Lower Risk Youths to Smoking Prevention Interventions," *Preventive Medicine*, vol. 26, no. 3 (May-June 1997), pp. 389-394.

25. Jerry Cromwell and others, "Cost-Effectiveness of the Clinical Practice Recommendations in the AHCPR Guideline for Smoking Cessation," *Journal of the American Medical Association*, vol. 278, no. 21 (December 3, 1997), pp. 1759-1766; and Jack E. Henningfield, "Nicotine Medications for Smoking Cessation," *New England Journal of Medicine*, vol. 333, no. 18 (November 2, 1995), pp. 1106-1203.

26. W. J. Popham and others, "Do Antismoking Media Campaigns Help Smokers Quit?" *Public Health Reports*, vol. 108 (1993), pp. 510-513.

three months.[27] And many of those who quit relapse within a year. Thus, only about 2.5 percent of smokers stop smoking permanently each year.[28]

It might be reasonable to assume that smoking cessation programs under the settlement would double the percentage of people who stopped smoking permanently, from 2.5 percent to 5 percent, at least in the first year or so.[29] After that, the supply of willing-to-quit smokers might be depleted, leaving only hard-core (and new regular) smokers in the pool of potential candidates for cessation.

Over time, the challenge of motivating people to stop smoking and to maintain their nonsmoking status would become more difficult, as those most likely to stop smoking actually do so. In the end, the infusion of cessation dollars might have a relatively large effect on consumption in the early years, but the effect would diminish substantially over time.

Much of the effect on cigarette consumption in the early years of the settlement would occur because people who would have stopped smoking later in life anyway may be induced to stop earlier. A shift toward early cessation would have desirable effects on people's health.[30] However, the total effect on consumption over the 25 years would be fairly modest.

The Net Effect

If the regulatory and public health interventions in the settlement were funded at the level that the provisions imply, those programs could lead to modest declines in smoking rates among adults and teenagers and in the number of cigarettes they consumed. CBO expects that most of the individual regulatory and public health components of the settlement would have only small effects on consumption by those two groups. However, as a total package, the synergy of the various interventions

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27. Jerry Cromwell, William J. Bartosch, and Janet B. Mitchell, *The Cost-Effectiveness of AHCPR's Smoking Cessation Guideline* (Department of Health and Human Services, Public Health Service, Agency for Health Care Policy and Research, December 1997); J. Kirscht, B. Brock, and V. Hawthorne, "Cigarette Smoking and Changes in Smoking Among a Cohort of Michigan Adults, 1980-1982," *American Journal of Public Health*, vol. 77 (1987), pp. 501-502; and Elizabeth A. Gilpin, John P. Pierce, and Arthur J. Farkas, "Duration of Smoking Abstinence and Success in Quitting," *Journal of the National Cancer Institute*, vol. 89, no. 8 (April 16, 1997), pp. 572-576.

28. "Smoking Cessation During Previous Year Among Adults: United States, 1990 and 1991," *Morbidity and Mortality Weekly Report*, vol. 42, no. 26 (July 9, 1993), pp. 504-507.

29. If 15 percent of smokers are currently willing to try to quit but only 2.5 percent actually succeed in quitting permanently each year, then the success rate among those willing to try to quit is 17 percent. Raising the success rate of cessation programs by 20 percent and expanding the want-to-quit population to 25 percent of smokers result in an overall quit rate among smokers of 5 percent (0.17 x 1.20 x 0.25).

30. J. Lightwood and S. Glantz, "Short-Term Economic and Health Benefits of Smoking Cessation: Myocardial Infarction and Stroke," *Circulation*, vol. 96 (1997), pp. 1089-1096.

could be instrumental in lowering consumption, especially among teens. Nonetheless, the relatively small share of total consumption that teenagers account for means that the impact of most youth-oriented interventions on cigarette consumption would be small over the next 10 to 20 years.

Specifically, CBO concludes that the combined nonprice interventions in the settlement might reduce the prevalence of smoking among today's teenagers by up to 4.5 percent in the first few years of the settlement. That drop would occur if spending by the industry on advertising and promotion fell by 15 percent, which might decrease teenagers' cigarette consumption by 1.5 percent, and if youth-oriented smoking control and prevention efforts permanently reduced teen smoking by about 3 percent. Those effects would be attenuated in later years and would apply only to each year's crop of new teenagers.

In the case of adults, the large infusion of funds that the settlement calls for to support smoking cessation has the best chance of altering smoking patterns. Cigarette consumption among adults might decrease by 5 percent in the first few years. About half of that effect would be due to the provisions of the settlement. In subsequent years, the settlement's provisions would have a much smaller incremental effect, perhaps about 0.1 percent per year. Added to that would be the small additional effect on adult smoking as new cohorts of adults with lower smoking rates entered the population.

Because teen smoking accounts for only 2 percent of all cigarettes consumed, in the settlement's early years the total reduction in cigarette consumption would be only slightly larger than that for adults. Total consumption might decline by as much as 8 percent by the 25th year following implementation of the settlement as a result of the regulatory and public health provisions. That estimate does not take into consideration the effect on consumption that would result from increases in the price of cigarettes.

CHAPTER IV
THE IMPACT OF REQUIRED INDUSTRY PAYMENTS

Along with the regulatory and public health provisions in the proposed settlement is the requirement that tobacco manufacturers make substantial annual payments for past and future costs related to smoking. In an attempt to defray the added costs of those payments, manufacturers would probably increase the price of cigarettes. A higher price would prompt consumers to cut back on smoking.

It is unclear by how much the tobacco industry would raise cigarette prices in response to the proposed cost increases in the settlement. Different pricing strategies by the industry could result in significantly different price increases. Even so, based on a review of the empirical evidence, CBO concludes that price increases would have a significant negative effect on consumers' demand for cigarettes and, depending on the ultimate increase in price, could be a highly effective way of reducing smoking in the United States. Each 10 percent increase in cigarette prices might lead to a decline in cigarette consumption of 2.5 percent to 5 percent. (That relationship between increases in price and decreases in consumption is known as an elasticity.)

After briefly reviewing the extensive empirical evidence on the effectiveness of price increases in reducing smoking, this chapter considers several possible pricing strategies that might be undertaken by the tobacco industry.

The Effect of Price Increases on Consumption

Empirical studies of the price elasticity of the demand for cigarettes have reported a wide range of estimates.[1] In its analysis, CBO relied primarily on studies of individuals' reported smoking behavior rather than on studies of aggregate cigarette sales across states, countries, or time periods. The individual-level studies generally make use of well-designed national surveys of smoking behavior and offer more opportunity for researchers to control for nonprice factors that might influence decisions about smoking.

Nonetheless, the estimated price elasticities vary from study to study because no two estimates are based on exactly the same population, time period, definition

1. Surgeon General of the United States, *Preventing Tobacco Use Among Young People* (1994).

of smoking, control variables, model of price response, or statistical method. Studies that account for the fact that consumers can sometimes cross state borders to buy cigarettes more cheaply have better designs than studies without such controls. And studies that adjust for differences in community attitudes or regulations have greater validity than those that do not. States with high tobacco excise taxes, for instance, and therefore high cigarette prices, may also have strong antitobacco sentiment, which would affect tobacco use independent of its price.

CBO examined nine studies of the price elasticity of demand for cigarettes (see Table 4). They are based on five separate national surveys that span various periods between the mid-1960s and the early 1990s. Most of the studies report two kinds of estimates: a participation elasticity, which indicates the effect of higher prices on the decision to smoke at all, and a total consumption elasticity, which measures the effect of higher prices on the number of cigarettes consumed.

The Response of Adults. Given the different surveys, methods, and years studied, the range of estimated total price elasticities of demand for cigarettes across the five studies of adults is surprisingly narrow, going from approximately -0.25 to -0.70. That means that a 10 percent increase in price would result in a decrease in cigarette consumption of between 2.5 percent and 7.0 percent. The high negative estimate of -0.70 is based on an analysis that did not adjust for the possibility that cigarette taxes (and hence prices) may be correlated with antitobacco sentiment in a state. Most studies that include such adjustments tend to exhibit price elasticities on the low end of the range.[2]

Most of the studies CBO considered assumed that consumption depends on the current price and is unaffected by an individual's addiction to tobacco, perceptions of long-run costs, or concerns about the future health consequences of smoking. Yet according to a model of "rational addiction," the full effect of a price change takes some time to emerge as smokers adjust their consumption in relation to higher prices. As a result, the long-run response in consumption is likely to be greater than the immediate effect.[3] Chaloupka estimated such a model using data

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2. Evans and Farrelley in their 1997 report (William N. Evans and Matthew C. Farrelly, "The Compensating Behavior of Smokers: Taxes, Tar and Nicotine" [working paper, Project HOPE, February 1997]) pooled data from the National Health Interview Surveys of 1979 and 1987 to estimate the price elasticity of cigarette consumption among smokers first without and then with specific adjustment for the state in which the respondent lived and the date of the survey. When state-specific effects were excluded, the pooled elasticity across the two years was -0.15. When state-specific effects were taken into account, the price elasticity of demand for cigarettes among smokers was actually positive, though not statistically significant. However, Evans and Farreley did not adjust for the possibility of people crossing the border to lower-tax states. As a result, all of the estimates are biased toward zero.

3. Gary S. Becker, Michael Grossman, and Kevin M. Murphy, "An Empirical Analysis of Cigarette Addiction," *American Economic Review*, vol. 84, no. 3 (June 1994), pp. 396-418.

from the late 1970s.[4] His estimates of the price elasticity range from -0.27 to -0.36, which are also at the low end of the span of estimated elasticities.

Based on a review of the studies summarized above, CBO concludes that the total price elasticity of demand is probably at the lower end of the range of estimates, between -0.25 and -0.50. That conclusion is consistent with the finding of a 1993 consensus panel review of elasticity estimates convened by the National Cancer Institute.[5] CBO estimates that between one-half and two-thirds of the reduction in smoking arising from a price increase is attributable to a decline in the percentage of people who smoke. The remainder is due to a decrease in the number of cigarettes that smokers consume.

The Response of Youth. In contrast to the consistent responsiveness of adults to changes in prices, the evidence on how young people respond is highly variable. Total consumption elasticities range from about +0.9 to -1.40, and participation elasticities range from about zero to -0.75. Most findings are on the high side of those ranges. Two studies using data from the National Health and Nutrition Examination Survey conducted between 1976 and 1980, however, found elasticities near zero. Although no clear trends emerge over time in the elasticity estimates of the various studies, one year-by-year analysis of rates of youth smoking across states found a steady upward trend in the participation elasticity over the 1977-1992 period.[6]

A recent study by Chaloupka and Grossman illustrates the findings of the individual-level analyses.[7] The authors controlled for both border crossing and differences across states in the strength of antismoking restrictions. Students who were in grades 8 through 12 in 1992 through 1994 were estimated to have a total price elasticity of cigarette consumption of -1.25. That response was divided about equally between changes in smoking participation and changes in consumption by those who smoked.

All but one of the studies considered in this analysis relied on cross-sectional surveys of young people's smoking habits rather than on surveys that tracked teens' smoking behavior over time. DeCicca, Kenkel, and Mathios recently reported the

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4. Frank J. Chaloupka, "Rational Addictive Behavior and Cigarette Smoking," *Journal of Political Economy*, vol. 99, no. 4 (1991), pp. 722-742.

5. National Cancer Institute, *The Impact of Cigarette Excise Taxes on Smoking Among Children and Adults* (August 1993).

6. William N. Evans and Lynn X. Huang, "The Impact of Cigarette Taxes on Teen Smoking: Evidence from Panels of Repeated Cross Sections" (working paper, University of Maryland, March 1997).

7. Frank J. Chaloupka and Michael Grossman, *Price, Tobacco Control Policies and Youth Smoking*, Working Paper No. 5740 (Cambridge, Mass.: National Bureau of Economic Research, September 1996).

TABLE 4. ESTIMATES OF PRICE ELASTICITIES OF DEMAND FOR CIGARETTES FROM SELECTED STUDIES

Study	Ages Covered	Price Elasticity				Adjustments[c]	
		Adults		Young People			
		Participation[a]	Total Consumption[b]	Participation[a]	Total Consumption[b]	Border Crossing?	Anti-Smoking Environment?
Lewit, Coate, and Grossman (1981)[d]	Ages 12 to 17			-1.0	-1.4	Yes	No
Lewit and Coate (1982)[e]	All Adults	-0.26	-0.42			Yes	No
	Ages 20 to 25			-0.74	-0.89		
Chaloupka (1991)[f]	Ages 17 to 73		-0.36 to -0.27			Yes	No
	Ages 17 to 24				-0.10 to +0.05		
Wasserman and others (1991)[g]	All Adults	-0.17	-0.26			Yes	Yes
	Ages 12 to 17				+0.86		
Chaloupka and Grossman(1996)[h]	Grades 8, 10, and 12			-0.60	-1.25	Yes	Yes
Evans and Farrelly (1995)[i]	All Adults	-0.11	-0.22			No	No
	Ages 18 to 24			-0.36	-0.63		
Evans and Farrelly (1997)[j]	Ages 40+	+0.14	-0.36			No	No
	Ages 25 to 39	-0.43	-0.76				
	Ages 18 to 24			-0.58	-0.8		
Chaloupka and Wechsler (1997)[k]	Students in 4-year colleges			-0.59 to -0.48	-1.04 to -0.90	Yes	Yes
DeCicca, Kenkel, and Mathios (1998)[l]	8th graders			-0.68		No	Yes
	10th graders			-0.52			
	12th graders			-0.48			

(Continued)

TABLE 4. CONTINUED

SOURCE: Congressional Budget Office using data from the sources in notes d through l.

a. The effect of higher prices on the decision to smoke at all.

b. The effect of higher prices on the average number of cigarettes consumed by each individual, including smokers and nonsmokers.

c. Did the study account for the fact that consumers sometimes cross state borders to buy cigarettes more cheaply? Did the study account for the fact that states with high tobacco excise taxes, and therefore high cigarette prices, may also have strong antitobacco sentiment, which would affect tobacco use independent of its price?

d. Eugene M. Lewit, Douglas Coate, and Michael Grossman, "The Effects of Government Regulation on Teenage Smoking," *Journal of Law and Economics*, vol. 24 (December 1981), pp. 545-573. The study was based on the National Health and Nutrition Examination Survey, 1966-1970.

e. Eugene M. Lewit and Douglas Coate, "The Potential for Using Excise Taxes to Reduce Smoking," *Journal of Health Economics*, vol. 1 (1982), pp. 121-145. The study was based on the National Health Interview Survey, 1976.

f. Frank J. Chaloupka, "Rational Addictive Behavior and Cigarette Smoking," *Journal of Political Economy*, vol. 99, no. 4 (1991), pp. 722-742. The study was based on the National Health and Nutrition Examination Survey, 1976-1980.

g. Jeffrey Wasserman and others, "The Effects of Excise Taxes and Regulations on Cigarette Smoking," *Journal of Health Economics*, vol. 10 (1991), pp. 43-64. The study of adults was based on the National Health Interview Survey, 1985, and the study of teenagers was based on the National Health and Nutrition Examination Survey, 1976-1980.

h. Frank J. Chaloupka and Michael Grossman, *Price, Tobacco Control Policies and Youth Smoking*, Working Paper No. 5740 (Cambridge, Mass.: National Bureau of Economic Research, September 1996). The study was based on the Monitoring the Future survey, 1992-1994.

i. William N. Evans and Matthew C. Farrelly, "The Compensating Behavior of Smokers: Taxes, Tar and Nicotine" (working paper, Project HOPE, November 1995). The study was based on the National Health Interview Survey for selected years, 1976-1992.

j. William N. Evans and Matthew C. Farrelly, "The Compensating Behavior of Smokers: Taxes, Tar and Nicotine" (working paper, Project HOPE, February 1997). The study was based on the National Health Interview Survey, 1987.

k. Frank J. Chaloupka and Henry Wechsler, "Price, Tobacco Control Policies and Smoking Among Young Adults," *Journal of Health Economics*, vol. 16 (1997), pp. 359-373. The study was based on the Harvard College Alcohol Study, 1993.

l. Philip DeCicca, Donald Kenkel, and Alan Mathios, "Putting Out the Fires: Will Higher Taxes Reduce Youth Smoking?" (draft, Cornell University, Ithaca, N.Y., December 1997). The study was based on the National Educational Longitudinal Study, 1988-1992.

results of a study of participation elasticities based on the National Education Longitudinal Survey.[8] The survey, which included over 25,000 8th-graders in 1988 who were reinterviewed at two-year intervals over the next four years, gathered data on factors that predisposed teenagers to begin smoking. The researchers controlled for the strength of the antismoking environment (as evidenced by the existence of state antismoking laws) but did not control for potential border crossing. Interestingly, children who eventually dropped out of school were much more likely than others to have smoked in the 8th grade. Low school achievement in the 8th grade was also a strong predictor of becoming a smoker in the future.

The participation elasticities that DeCicca and colleagues estimated at each follow-up age were similar to those found in the cross-sectional studies CBO considered--roughly -0.50 to -0.70. However, when children who were already smoking at the time of the first survey in 8th grade were excluded from the analysis, the effect of price on the probability of starting to smoke by the 12th grade was essentially zero.[9]

That finding should be troubling to those who look forward to a large increase in tobacco prices as a foolproof means of reducing rates of youth smoking. It is possible that existing studies showing high price elasticities among teens and young adults, which use similar state-level adjusters, may have inadequately controlled for the effect of the community environment.

In summary, most of the evidence points to a relatively high total price elasticity of tobacco consumption among teenagers and young adults, on the order of -1.00, and participation elasticities ranging from -0.50 to -0.75. But those estimates could be exceedingly optimistic. How young people would respond to large changes in the price of cigarettes remains, like many of their behaviors, uncertain.

Price Increases Under the Settlement

Any payment required of the tobacco industry would result in some increase in the price of cigarettes. The size of that increase would depend on the added cost per pack, the response of the industry to the settlement, and the responsiveness of

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8. Philip DeCicca, Donald Kenkel, and Alan Mathios, "Putting Out the Fires: Will Higher Taxes Reduce Youth Smoking?" (draft, Cornell University, Ithaca, N.Y., December 1997).

9. The reasons for that finding are unclear. The few children who did smoke in the 8th grade were relatively concentrated in a few states, particularly the tobacco-producing states. That result could mean that the methods used to control for the effect of the community environment on smoking participation did not adequately capture that confounding influence.

consumers to the change in price. In particular, pricing would depend on the nature of competition within an industry dominated by a few very large firms.

Structure of the Tobacco Industry. As noted earlier, five companies produce nearly all of the cigarettes sold in the United States today. For almost 15 years, Philip Morris has been the leading cigarette manufacturer; in 1996, it controlled 48 percent of the U.S. cigarette market. R.J. Reynolds followed with 25 percent, Brown and Williamson with 17 percent, Lorillard with 8 percent, and Liggett with 2 percent.[10]

Two major barriers have kept new competitors from entering the cigarette market. The first is the massive expenditure required for equipment to achieve production efficiency equal to that of the major cigarette manufacturers. The second barrier is the equally massive advertising spending that would be needed to achieve some level of brand recognition.[11] New entrants may also have been discouraged by the decline in smoking that has occurred in the United States since the 1960s.

Because the tobacco market is dominated by only a few large firms, tobacco prices as well as profits are probably higher than if the market were perfectly competitive. Each of the tobacco companies clearly recognizes that the success of their individual decisions to set cigarette prices or differentiate their products to increase their market share depends on the reactions of only four other firms. Thus, during much of the period between the early 1950s and the late 1970s, the cigarette market remained orderly, with stable or rising prices (in nominal terms). The apparent coordination of price increases during that time was probably a natural consequence of an oligopolistic market serving consumers who were fairly insensitive to price increases.

Even in such a market, however, increased competition among firms can arise. Liggett's introduction in 1980 of generic (nonbranded) cigarettes that were priced from 25 percent to 40 percent less than premium cigarettes was an attempt to increase its share of the market. R.J. Reynolds also introduced discounted brands of cigarettes for some of its branded products in 1984, and Liggett responded with more deeply discounted brands in 1989.

Although discounting increased throughout the 1980s and early 1990s, average cigarette prices rose substantially. The market share of discounted cigarettes shot up to over 35 percent during that period. Finally, Philip Morris and other

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10. Federal Trade Commission, *Competition and the Financial Impact of the Proposed Tobacco Industry Settlement* (September 1997).

11. Craig Howell and others, "Pricing Practices for Tobacco Products, 1980-1994," *Monthly Labor Review*, vol. 117 (December 1994).

cigarette companies cut the prices of their premium brands in 1993, and since then the market share of discounted cigarettes has fallen below 30 percent.

The settlement would allow tobacco companies greater freedom to coordinate their pricing and marketing strategies without fear of antitrust action. Moreover, it would specifically exempt from enforcement any coordination among the companies that was necessary to reduce the use of tobacco by teenagers. The Federal Trade Commission (FTC), however, has suggested that the settlement's extension of antitrust immunity could lead to price increases equal to or greater than those necessary to "pass through" the costs of scheduled payments to tobacco consumers.[12]

Passing the Scheduled Payments Through to Consumers. The settlement states that if tobacco consumption remained at current levels, the industry would make tax-deductible payments totaling $368.5 billion (in 1998 dollars) over the next 25 years. If consumption declined over time, payments would be reduced proportionately. The proportionate reduction in the payments means that they would remain at the same amount per pack, regardless of the decline in cigarette consumption. To that extent, the payment mechanism in the settlement is equivalent to an excise tax.

If tobacco consumption did not fall over time, the industry's annual payment would be $15 billion (in inflation-adjusted terms) in most future years. Assuming consumption of about 24 billion packs of cigarettes in 1997, the payment would amount to about 63 cents per pack. Some analysts have suggested that the industry could be held harmless by simply passing the cost increase along to consumers, raising the price of a pack of cigarettes by 63 cents above its average price of $2.01 today.

But a price increase of that kind would induce consumers to smoke less. Using an illustrative demand elasticity of -0.40 (near the middle of the range discussed earlier), a 63-cent increase in the price of a pack of cigarettes would lower sales by about 13 percent--from 24 billion packs to 21 billion. Because scheduled payments would decline if total consumption fell, the annual payment under this scenario would fall from $15 billion to about $13 billion--again amounting to 63 cents per pack.

Whether cigarette prices would actually increase by 63 cents per pack in the event that the settlement was implemented is not at all certain. If competitive forces dominate, the industry at most might be able to pass along its cost increase, and the average price of cigarettes might rise by as much as the added cost of 63 cents. If the

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12. Federal Trade Commission, *Competition and the Financial Impact of the Proposed Tobacco Industry Settlement.*

settlement increased coordination in the industry, however, the price of cigarettes could rise by considerably more than the increase in costs.

How High Could Prices Go? The FTC suggests that the average price of cigarettes could rise under the settlement by roughly $1.20 per pack within five years--significantly more than the industry's added cost.[13] The FTC based its analysis in part on evidence from past increases in state and federal tobacco excise taxes. Often, when excise taxes were increased, the average price of cigarettes rose by more than the amount of the tax hike itself, even without any relaxation in antitrust policies.

Projections of price increases made by the cigarette manufacturers themselves support that conclusion. They claim that the price of cigarettes would increase by at least $1.20 per pack (in nominal dollars) by the fifth year of the settlement and by at least $1.50 per pack by the 10th year.[14]

A recent analysis by Harris estimates that if cigarette pricing was perfectly coordinated--as if the market was controlled by a single firm--setting the price of a pack of cigarettes at just over $4 would maximize the profits of the tobacco industry.[15] To understand that analysis, consider what would happen to the industry's revenue today if the market price was raised by $1 per pack, without regard to the proposed settlement. Current revenue is about $48 billion per year, based on an average price of cigarettes of $2.01 per pack and total sales of about 24 billion packs a year. If the price was raised by a dollar per pack to $3.01, sales would fall from 24 billion packs to 19 billion. (CBO used a demand elasticity of -0.40 to calculate the drop in sales.) Industry revenue would rise, however, by $9 billion to a total of $57 billion; industry profits would go up by even more than that amount because total production costs would decline as a result of lower output. Similar calculations would also apply for larger increases in price, up to about a $2 price increase. However, increasing the price much above $4 per pack would reduce total revenues and total profits.

A number of possible reasons might explain why the industry has not raised prices to $4 per pack. Firms may lack the discipline to stick with a policy that would raise the market price substantially. Within the group of five major companies, there would be a clear opportunity for one or two firms to increase their market share by

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13. Federal Trade Commission, *Competition and the Financial Impact of the Proposed Tobacco Industry Settlement.*

14. Those increases amount to about $1.07 and $1.17 per pack, respectively, in inflation-adjusted terms. See Lorillard Tobacco Company, Philip Morris Companies, Inc., R.J. Reynolds Tobacco Company, and UST, Inc., *Impact of the Proposed Resolution of the U.S. Cigarette Industry* (October 1997).

15. Jeffrey E. Harris, "American Cigarette Manufacturers' Ability to Pay Damages: Overview and a Rough Calculation," *Tobacco Control*, no. 5 (1996).

not going along fully with an industrywide price increase. Indeed, the implicit threat of that type of behavior might be enough to keep market prices from rising by large amounts. Even so, it is difficult to see how the current market price would be so far below the presumed optimal price if that threat were the only factor holding down marketwide price increases.

An alternative explanation is that economists might be wrong about the price elasticity of demand or they might be applying it inappropriately. Demand elasticities are estimated using observations of actual variations in market prices and cigarette consumption across regions or time periods, and are accurate only for price increases of the same order of magnitude as those observed in the past. The available estimates may not be a reliable guide to the likely response of consumers faced with a near-doubling of prices.

In particular, it is plausible that the demand elasticity appropriate to a very large increase in cigarette prices is much larger than the -0.25 to -0.50 range arrived at by economists.[16] Especially over the longer term, a large price increase might induce many current smokers to consume much less tobacco and might discourage nonsmokers from starting to smoke. A large price elasticity associated with teenage cigarette consumption is consistent with that conjecture. If that was indeed the case, it might be preferable from the industry's standpoint to keep tobacco prices relatively low and accept lower short-term profits in exchange for continued profitability in the future.

Those potential explanations have different implications for the effect of the proposed settlement on the price of cigarettes. Both explanations--a competitive market and a larger long-run elasticity of demand associated with substantial price increases for a pack of cigarettes--would imply relatively modest increases in price for a given increase in industry costs. To the extent that the tobacco industry prices its products competitively, any increase in costs would at most be passed through to consumers. Alternatively, if pricing in the industry was more coordinated but the industry would face sharply falling demand if it raised prices substantially, then a cost increase would also be likely to result in a limited increase in cigarette prices.

Yet other aspects of the proposed settlement could lead to considerably different price outcomes. Most important, the settlement would allow tobacco companies to coordinate price increases without fear of antitrust action. Assuming that competition in the tobacco market is now responsible for prices remaining below what would be charged if the industry were controlled by just one firm, the settlement could lead to cigarette price increases that were considerably greater than the increase

16. It is also possible that the demand elasticity is roughly equal to or even smaller than the -0.25 to -0.50 range. If that was the case, a plausible explanation for the absence of a much higher price for cigarettes today would be a high degree of competition in the industry.

in costs. Alternatively, if elastic demand is responsible for today's low market price, then prices in the industry might rise by only a limited amount--even with the encouragement that the settlement provides to tobacco companies to coordinate pricing.

It is certainly plausible that the payment provisions in the settlement might cause the price of cigarettes to rise by an amount similar to the 63 cents that is commonly discussed. But there is a significant possibility that the price increase would be greater, depending on the pricing strategy of the industry and the behavior of smokers with respect to a large increase in price. Other factors--in particular, the tax deductibility of the industry's payments--could also have an impact on the increase in cigarette prices that would result from the settlement (see Box 2).

BOX 2.
TAX TREATMENT OF THE INDUSTRY'S PAYMENTS

An additional factor influencing the price rise that could result from the settlement is the tax treatment of the required industry payments. The settlement states that the payments would be considered ordinary business expenses for the tobacco firms, which would make them deductible under the corporate income tax. Assuming a tax rate of 35 percent for those firms (consisting of 30 percent federal and 5 percent state and local taxes), this feature of the settlement implies that on an after-tax basis, the cost to the industry would end up as only 65 percent of the stated payment amounts. The remainder would be offset by lower corporate profit taxes paid to the government. Similarly, however, any added industry revenue resulting from an increase in the price of cigarettes would be considered taxable income. Therefore, on an after-tax basis, the industry would keep only about 65 percent of any added revenues.

As long as the payments are tax-deductible, the relationship between payments and price increases can be examined on a before-tax or after-tax basis with the same effect. On a pretax basis, the industry would receive 100 percent of additional revenue from any price increase related to the settlement, but it would have costs equal to 100 percent of the payment amount. On an after-tax basis, the firms would keep only 65 percent of the added revenue from the price increase, but they would have additional costs of only 65 percent of the payment amount.

If the payments were not tax-deductible, however, the price of cigarettes would have to be increased by considerably more than the presumed 63 cents for the industry to be able to "pass through" its added costs. In that circumstance, the price of cigarettes would have to be increased by about 90 cents in order to pass through the industry's cost increase of 63 cents, net of taxes, to the consumer.

CHAPTER V
CIGARETTE CONSUMPTION AND INDUSTRY PAYMENTS UNDER THE SETTLEMENT

Industry payments would not, under any plausible set of assumptions, approach the $368.5 billion figure that is commonly cited as the 25-year total under the settlement. That figure is based on the assumption that cigarette consumption would remain at its current level. But even without the settlement, tobacco consumption in the United States is likely to follow its past downward trend, reflecting changes in consumer preferences about smoking and steadily rising retail prices. That trend, combined with consumption declines resulting from the settlement, would reduce industry payments well below $368.5 billion.

Another feature of the settlement that could curb the industry's payments to government agencies (but not total industry costs) is that it would allow the industry to lower its payments if it also had to make payments to individuals as a result of private lawsuits. Under the accord, the tobacco firms would receive a credit of 80 percent of the amount of those private claims. That amount could offset up to one-third of the total payment otherwise required under the settlement. Thus, for example, if the industry's scheduled payment was $15 billion in a given year, it would be reduced by $4 billion if the industry had private claims amounting to at least $5 billion in that year.

Yet because the $368.5 billion figure is in 1998 dollars, nominal payments could be higher than that amount. The settlement specifies that payments would be indexed for inflation--adjusted upward annually by 3 percent or the increase in the consumer price index, whichever was larger. For example, if the scheduled payments were inflated by 3 percent a year, nominal payments would total about $550 billion over 25 years provided that consumption remained unchanged. Industry payments could also be higher because cigarette manufacturers would face penalties of up to $2 billion annually (in 1998 dollars) if teenage smoking did not fall by specified amounts.

Industry Payments Under Alternative Assumptions

Payments by the tobacco industry under the settlement would depend on the size of the price increase that resulted from the accord, the extent of new regulatory and public health measures, and the response of consumers to both of those changes. This section presents illustrative calculations of tobacco industry payments under

alternative assumptions regarding settlement-induced increases in the price of cigarettes. Those estimates represent payments that would be made by tobacco companies and not the impact of the settlement on federal or state budgets.

The calculations below assume that the settlement first becomes effective in 1998. That is, the first scheduled payment of $10 billion would be made in 1998, and subsequent payments would be adjusted for inflation. Scheduled payments are tied to the number of cigarettes consumed in 1997, with declines in consumption in later years lowering the aggregate payments from the industry proportionally. The estimates exclude any additional payments that might be required if the percentage of teenagers who smoke does not decline sufficiently. Aggregate payment levels are the sum over 25 years of the annual payments measured in 1998 dollars.

In this paper, the impact of the settlement on the industry's payments and on tobacco consumption is described in terms of changes from a benchmark level, and two different benchmarks are used. The first, referred to as the base case, assumes that there would be no change in cigarette consumption except for the effects of the settlement. Although that benchmark is unrealistic, it is implicit in many public statements that have been made about the settlement.

The second benchmark assumes that cigarette consumption would decline in future years even without a federally legislated settlement. Of course, considerable uncertainty pervades any estimate of such a baseline reduction in smoking, and alternative assumptions could be made regarding its size. CBO's analysis demonstrates that the incremental impact of the settlement on cigarette consumption would be substantially smaller under reasonable assumptions about future declines in smoking than under the base case.

The Base Case

For comparison purposes, the base case presents the simple constant-consumption scenario often used to characterize the proposed settlement (see Table 5). Without any change in the inflation-adjusted price of cigarettes or any reduction in the consumption of tobacco, the industry would pay $368.5 billion (in 1998 dollars) over the next 25 years.

Cost Pass-Through. One policy scenario assumes that industry payments would be passed through to consumers, in the sense that the price increase in a given year would equal the amount per pack that the industry would have to pay under the settlement. As discussed earlier, after the first few years of the settlement, the price increase necessary to "pay for" the industry's payment would be 63 cents in 1998 dollars. Thus, in this example, cigarette prices in future years would rise to and

TABLE 5. SETTLEMENT PAYMENTS AND REDUCED CIGARETTE CONSUMPTION OVER 25 YEARS COMPARED WITH THE BASE CASE

Price Increase per Pack (Dollars)	Inflation Adjustment[a]	Regulatory Impact[b]	Price Elasticity of -0.25		Price Elasticity of -0.50	
			Industry Payment (Billions of 1998 dollars)	Change in Consumption by the 25th Year (Percent)	Industry Payment (Billions of 1998 dollars)	Change in Consumption by the 25th Year (Percent)
Base Case						
0	n.a.	n.a.	368.5	0	368.5	0
Policy Scenarios						
0.63	Yes	No	344	-7	320	-14
0.63	Yes	Yes	324	-14	302	-20
1.50	Yes	Yes	284	-25	221	-42
1.50	No	Yes	294	-20	236	-35

SOURCE: Congressional Budget Office calculations.

NOTES: Cigarette consumption in 1997 totaled 23.75 billion packs.

n.a. = not applicable.

a. The price increase per pack is assumed to rise by 3 percent annually because of inflation.

b. Assumes an initial 5 percent decline in consumption in the first few years plus a subsequent downward trend in consumption of 0.1 percent to 0.2 percent annually resulting from the regulatory and public health provisions of the settlement.

remain at $2.64 per pack in 1998 dollars. In nominal terms, the price would rise from $2.64 in the first year of the settlement to $5.37 in the 25th year, reflecting a 3 percent annual adjustment for inflation.

The amount that the industry pays under the cost pass-through scenario depends in part on how consumers respond to a sizable increase in the price of cigarettes. The payment also depends on whether there would be only a pure price increase or a more comprehensive policy that included regulatory and public health provisions. To simplify the discussion, CBO assumed that there were no factors other than the settlement that might raise the price of cigarettes; it also ignored any reductions in the number of cigarettes consumed that were unrelated to the settlement.

As discussed earlier, the response of consumers to cigarette price increases cannot be known with certainty. For the examples presented here, a range of responses is considered. A large response is based on a price elasticity of -0.50, which means that a 10 percent increase in price would reduce cigarette consumption by 5 percent; a small response is based on a price elasticity of -0.25. If the response in demand to the 63-cent price increase was large, then industry payments over 25 years under a pure pricing policy (that is, a policy that only raised prices and incorporated no other antismoking provisions) would total $320 billion. If the response was small, industry payments would total $344 billion.

A more comprehensive policy that combined a 63-cent price hike with increased regulatory restrictions and other antismoking provisions specified in the settlement would yield somewhat smaller industry payments than a pure pricing policy. That outcome results from the larger reductions in cigarette consumption that would be expected under the more comprehensive policy. The effects of the nonprice provisions on cigarette consumption are not known with certainty. Based on the earlier discussion in this paper, CBO assumed in the examples that follow that regulatory and other nonprice provisions in the settlement would reduce consumption by about 5 percent over the first few years after the settlement was implemented and by an additional 0.1 percent to 0.2 percent in each subsequent year.

Under those assumptions, a comprehensive settlement would result in industry payments over 25 years of $302 billion if the demand response to the 63-cent price increase was large. That payment is $18 billion smaller than the payment that would be required without the nonprice provisions. If the response was small, industry payments would total $324 billion, or about $20 billion less than under the pure pricing policy.

This example demonstrates the potential effectiveness of price increases and regulatory measures in reducing the consumption of tobacco. At the end of 25 years,

a comprehensive policy would have reduced consumption by 14 percent under the small-response scenario and 20 percent under the large-response one. Of course, the payments made by tobacco companies would decline the more smoking was reduced. For that reason, there is no plausible set of assumptions under which tobacco companies would actually make payments of $368.5 billion. Even if the settlement was completely ineffective in reducing smoking, the downward secular trend in consumption that has prevailed for many years would lead to a reduction in payments well below that amount.

How would the industry fare under this pass-through example? In particular, would an increase in price of 63 cents per pack be enough to leave the industry no worse off than it is today? The answer is, probably not. In future years, the drop in cigarette consumption arising from higher prices and tighter regulations would nearly offset the higher revenue per pack. Although lower sales and, perhaps, lower advertising expenses under the settlement would result in lower production costs for the industry, the price increase would not provide sufficient additional funds to cover the roughly $300 billion in required payments. The net result is that the industry might end up paying a significant share of the settlement's required payments from its own profits.

Larger Price Increases. As discussed earlier, the tobacco industry might also increase prices by more than 63 cents a pack if the settlement was enacted. Suppose the price of cigarettes rose immediately by $1.50 per pack and was adjusted annually for inflation. Cigarette prices would then rise to and remain at $3.51 per pack (in 1998 dollars). Under that assumption, industry payments would range from $221 billion (large response) to $284 billion (small response). The decline in consumption after 25 years would range from 25 percent in the small-response scenario to 42 percent in the large-response one.

The industry might fare better with an increase of $1.50 per pack than with the 63-cent increase of the cost pass-through scenario. Although cigarette sales would be lower, the significantly higher price might well generate more revenue for the industry than if there had been no settlement. Moreover, settlement payments in this example would be lower than in the case of a 63-cent-per-pack price increase, and production costs would decline by more than they would in that scenario. The net result is that the industry might be able to make the required payments without reducing profits.[1]

Adjusting cigarette price increases for inflation can significantly alter the settlement's policy impact. Consider a $1.50 nominal increase in cigarette prices--

1. The settlement requires an increase in annual payments if in any year declines in consumption cause payments to be reduced and inflation-adjusted industry profits rise above current levels. The added payment would be 25 percent of the increase in industry profits.

which could be accomplished by a one-time increase in the federal excise tax. The initial $1.50 increase would decline in 1998 dollars from $1.50 to $0.74 per pack over the 25-year period, and real cigarette prices would fall from $3.51 to $2.75. Cumulative industry payments in 1998 dollars would range from $236 billion (assuming a large reduction in cigarette demand) to $294 billion (assuming a small response). The decline in consumption after 25 years in this case would be 20 percent in the small-response scenario and 35 percent in the large-response one--less than in the case in which the $1.50 price increase was adjusted for inflation.

A More Realistic Benchmark

Tobacco use in the United States is likely to fall even in the absence of comprehensive federal legislation. Over the past 20 years, the demand for cigarettes has declined, in part, perhaps, because of growing public awareness of the relationship between smoking and health and also because of retail prices that have continued to climb. Although the increases in teenage smoking observed recently in some national surveys give reason for pause, cigarette consumption overall will probably continue to erode over time.

In contrast, cigarette prices are likely to continue their upward climb in the foreseeable future because of higher costs incurred by the industry and the imposition of higher federal and state excise taxes. The tobacco industry faces rising costs from litigation, particularly in cases brought by the states. Without legislation enacting the settlement, the industry may well be burdened with large payments to states and individuals to resolve outstanding lawsuits. In addition, many states are planning to boost state excise taxes. Although some states may defer such a tax increase if they are negotiating the resolution of a suit, there is little doubt that excise tax rates will rise nationwide. Furthermore, the federal excise tax on cigarettes is scheduled to increase by 10 cents a pack in 2000 and by another 5 cents a pack in 2002. All of those factors could increase the price of cigarettes and reduce consumption substantially in the absence of a national settlement.

In addition, regulatory efforts related to tobacco consumption may intensify. Public sentiment appears to be turning against the tobacco industry in the face of widely publicized arguments raised in court actions brought by several states. The change in opinion regarding smoking could result in increased state legislation restricting the use of tobacco products. Federal regulatory pressure might also increase, even if no additional legislation is enacted. If the Food and Drug Administration's authority over tobacco is substantially upheld in court, federal regulation of the tobacco industry might become more effective, and consumption might be further reduced.

By omitting from consideration those likely patterns of rising prices and falling consumption, the earlier analysis of policies under the base case estimated the *maximum* impact the settlement itself might have on consumption. Alternatively, one can examine the *additional* reduction in smoking that might result from the imposition of the settlement after taking those probable declines into account.

CBO's alternative benchmark assumes that about half of a 63-cent-per-pack price increase (in inflation-adjusted terms) would gradually occur even without comprehensive federal legislation, as the industry resolves future lawsuits. Higher state and federal excise taxes plus boosts in the costs of production and sales might further increase retail prices by between 1 percent and 2 percent a year. Moreover, the decline in cigarette consumption of about half a percent a year over the past decade--which is unrelated to any price increases--might be expected to continue.

Under those assumptions, cigarette consumption 25 years from now would have fallen by 16 percent, and the industry would have paid about $160 billion to resolve pending litigation (see Table 6). For the sake of simplicity, the discussion considers only this one benchmark.

Cost Pass-Through. The cost pass-through scenario assumes that the scheduled payments under the settlement cause cigarette prices to rise by a total of 63 cents per pack. A policy that was confined to the price increase alone would require that the tobacco industry pay $298 billion if the demand response was large or $309 billion if the response was small. But half of that price rise would occur under the benchmark even without federal legislation. The additional payment that the industry would make above what they would have paid even without legislation is $138 billion to $149 billion over the next 25 years.

Those payments correspond to a larger total reduction in cigarette consumption than would occur under the base case. Under benchmark assumptions, consumption would have declined by 16 percent by the 25th year. If the policy that was implemented led only to increases in the price of cigarettes, with no regulatory or public health provisions, consumption would decline by 19 percent to 22 percent. Thus, the incremental reduction that results from the policy is 3 to 6 percentage points.

A comprehensive policy that combined the 63-cent cost pass-through with regulatory and public health initiatives would have a greater impact on cigarette consumption, resulting in smaller industry payments than a policy that only increased prices. The total payments of $288 billion to $298 billion are also smaller than those estimated under the base case--and are about $75 billion less than the often-discussed total of $368.5 billion. Those payments correspond to reduced consumption of 23 percent to 26 percent in total by the 25th year.

TABLE 6. SETTLEMENT PAYMENTS AND REDUCED CIGARETTE CONSUMPTION OVER 25 YEARS COMPARED WITH AN ALTERNATIVE BENCHMARK

Price Increase per Pack (Dollars)	Inflation Adjustment[a]	Regulatory Impact[b]	Industry Payments (Billions of 1998 dollars) Projected in Benchmark	Increment due to Settlement	Total	Change in Consumption by the 25th Year (Percent) Projected in Benchmark	Increment due to Settlement	Total Change in Consumption
Benchmark: Consumption Declines Without Federal Legislation								
c	n.a.	n.a.	160	0	160	-16	0	-16
Policy Scenarios								
Price Elasticity of -0.25								
0.63	Yes	No	160	149	309	-16	-3	-19
0.63	Yes	Yes	160	138	298	-16	-7	-23
1.50	Yes	Yes	160	103	263	-16	-16	-32
1.50	No	Yes	160	111	271	-16	-12	-28
Price Elasticity of -0.50								
0.63	Yes	No	160	138	298	-16	-6	-22
0.63	Yes	Yes	160	128	288	-16	-10	-26
1.50	Yes	Yes	160	56	216	-16	-29	-45
1.50	No	Yes	160	70	230	-16	-22	-38

SOURCE: Congressional Budget Office calculations.

NOTES: Cigarette consumption in 1997 totaled 23.75 billion packs.

n.a. = not applicable.

a. The price increase per pack is assumed to rise by 3 percent annually because of inflation.
b. Assumes an incremental 2.5 percent decline in consumption (compared with the benchmark) in the first few years of the settlement. A subsequent downward trend in consumption of about 0.1 percent annually is also assumed. Both of those reductions are the product of the settlement's regulatory and public health provisions.
c. Assumes that cigarette prices rise by an average of about 1 percent a year over 25 years.

Although the estimates above reflect industry payments and consumption declines under a more realistic benchmark, they overstate the contribution of a comprehensive settlement to those outcomes. Measured in incremental terms, the settlement would result in additional payments of $128 billion to $138 billion and additional reductions in consumption of 7 percent to 10 percent.

Larger Price Increases. A similar pattern is seen using the assumption that prices would increase by $1.50 per pack as a result of a settlement. If that price increase was adjusted annually for inflation, industry payments would total from $216 billion to $263 billion. A comprehensive settlement would require from $56 billion to $103 billion in additional payments by the industry above the amounts that would be paid under the benchmark. The decline in consumption would range from 32 percent in the small-response scenario to 45 percent in the large-response one. But the incremental reductions in smoking that resulted from the settlement would range from 16 percent to 29 percent.

Confining the $1.50-per-pack price hike to a one-time increase that is not adjusted for inflation yields a similar pattern. The required payments would be somewhat larger and the consumption effects somewhat smaller than those estimated under the preceding scenario that adjusts the price increase for inflation.

CHAPTER VI
REDUCING TEEN SMOKING AND OTHER CONSIDERATIONS

For over three decades, the Surgeon General and other public health officials have identified smoking as the leading preventable cause of disease and premature death in the United States. Thus, the overriding concern expressed by federal policymakers regarding the proposed settlement is to reduce cigarette consumption, especially among teenagers.

The combination of policy options included in the settlement represents the most comprehensive proposal ever considered for reducing tobacco consumption, short of completely banning the product itself. But as discussed earlier, the research literature is mixed on how effective the interventions proposed in the settlement's major provisions might be in reducing cigarette consumption by large amounts. Industry payments under the settlement depend ultimately on the effectiveness of those interventions.

The settlement does not establish explicit goals for reducing overall cigarette consumption, but it does establish targets for reducing the percentage of teenagers who smoke on a daily basis. It also requires additional payments from the industry if those targets are not met. In any event, the settlement's provisions would certainly discourage some teens from smoking. Such efforts might have a lasting effect on cigarette consumption, depending on whether teens who did not smoke later took up the habit as adults.

In addition to its impact on smoking levels, the settlement is likely to have other consequences. Issues discussed briefly below include:

- The growth of a black market for cigarettes;
- Funding the settlement through an excise tax increase rather than an industry-coordinated price increase;
- Funding public health programs through industry payments under the settlement;
- Adverse consequences for tobacco growers and others dependent on the tobacco industry for their livelihoods; and

- The impact of the settlement on the future costs of publicly funded health care programs, including Medicare and Medicaid.

Can Targets for Teenage Smoking Be Met?

The settlement would require sharp reductions in the use of cigarettes by young people who are below the legal age of 18 years or, at a state's option, a higher age. If the percentage of teenagers who smoke on a daily basis fell by less than 30 percent by the fifth year after the enactment of the settlement, by less than 50 percent by the seventh year, and by less than 60 percent by the 10th year, cigarette companies would be required to make additional payments. Those payments (the settlement calls them a surcharge) are intended to eliminate the profit from the sale of cigarettes to "extra" teenage smokers over the course of their lifetimes, measured in present-value terms.

The surcharge would be about $80 million for each percentage-point difference between the required reductions and the actual reductions in teen smoking. For example, if after five years the rate of teen smoking had fallen by only 10 percent instead of the required 30 percent, the settlement would require cigarette manufacturers to pay $1.6 billion in penalties. The maximum surcharge would be $2 billion per year (in 1998 dollars).

Two provisions in the settlement would reduce the financial burden of surcharges. First, the federal government would return up to 75 percent of a surcharge to the tobacco companies if the companies could prove to the Food and Drug Administration that they had fully complied with the settlement, taken all reasonable measures to reduce underage tobacco use, and not tried to undermine the achievement of the required reductions.

A second provision reduces the amount of the surcharges by preventing the double-counting of teenagers whose smoking had already resulted in the imposition of a surcharge. Following the previous example, in year 5 of the settlement, cigarette manufacturers would be assessed a surcharge of $1.6 billion if the proportion of teens who smoke had fallen by only 10 percent instead of the required 30 percent. If in year 6 of the settlement, the rate of teen smoking was unchanged, the surcharge for that year would not be $1.6 billion. Instead, the surcharge would be smaller, because the cigarette manufacturers would have already paid a surcharge for most of the existing teen smokers in year 5. The surcharge for year 6 presumably would be based on new teen smokers, but the settlement provides little guidance on how to calculate surcharges under such a circumstance.

It is quite unlikely that all of the teenage smoking targets established under the settlement would be met. The price of cigarettes would probably rise substantially

and regulatory and public health efforts would also expand, but the effectiveness of each of those provisions in reducing teen smoking is highly uncertain. At best, a 63-cent one-time price increase might decrease youth smoking rates by about 23 percent. (That calculation uses an elasticity of -0.75.) The regulatory and public health provisions of the settlement might further reduce the prevalence of daily teenage smoking by 4.5 percent over five years. Thus, the combined effect of the settlement's provisions might be sufficient to achieve the five-year target. Another plausible outcome is that price increases would have little or no impact on teenagers' decisions to smoke, in which case the percentage of teen smokers might decline by much less than the targets. In any event, the seven- and 10-year goals would not be met under a 63-cent price increase. They could be met if the price was increased by $1.50 and the optimistic assumptions about teen responsiveness were correct.

Whether efforts to curtail smoking by teenagers would affect cigarette consumption over the long term is also uncertain. Some teenagers who were dissuaded from smoking during their teen years might take up smoking as adults. But if the settlement was effective in permanently preventing teenagers from smoking, total consumption of cigarettes might show sizable declines over the course of several decades as generations with low smoking rates came to dominate the population.

Other Consequences of the Settlement

The tobacco settlement would have consequences for manufacturers of tobacco products, retailers, advertisers, consumers, and all levels of government. Many of those consequences were specifically addressed in the settlement. Others that may not have been fully addressed could gain importance in the drafting of legislation.

Black-Market Cigarettes. Any legislation that would rapidly raise the price of a product by a third or more would almost certainly spawn a black market as people attempted to evade the high prices. Tobacco is no exception. Indeed, state and local officials periodically find cigarettes from states with low excise taxes being shipped to retailers in high-tax states even under the pricing and regulatory structure that affects cigarettes today. There have also been well-publicized instances of cigarettes being sold in large quantities through American Indian reservations (which are not subject to federal and state excise taxes) to purchasers in the United States and Canada who would otherwise face significantly higher prices.

Because the settlement would be national in scope, interstate sales of cigarettes would not avoid the higher prices or other restrictions placed on them. The settlement states that its rules would apply to all cigarettes sold in the United States as well as in lands under the jurisdiction of an American Indian tribe. Moreover,

scheduled payments would be levied on all manufacturers of cigarettes sold in the United States by both domestic and foreign producers. Payments would be allocated to each producer according to its share of the previous year's sales.

Enforcement of those requirements would be the key to limiting the growth of black markets for cigarettes. With cigarette prices spurting up solely because of federally mandated penalties but no change in the other costs of manufacturing cigarettes, a strong incentive would be created to develop alternative production capacity or to divert some of what is being produced already from current manufacturers into the black market without federal inspectors knowing that those cigarettes had been produced. Counterfeit or look-alike versions of popular American brands could also become more common in the U.S. market.

Another potential outcome is that foreign countries would become a source of cigarettes for U.S. black markets. American tobacco manufacturers could continue to legitimately ship large quantities of cigarettes to their foreign distributors, and those cigarettes would not have the added costs imposed by the scheduled payments. Some wholesalers outside the United States would find it profitable to ship American cigarettes back into this country, where the product could be sold illegally at bargain prices.

Individual smokers would benefit from lower prices for black-market cigarettes, particularly if they dealt directly with cigarette smugglers. Some of the illegal trade might also take place between a few small retailers and their suppliers, with black-market cigarettes displacing legal cigarettes on retail shelves. In that case, illegal cigarettes would probably be sold at the price prevailing for the legal product to minimize detection by law enforcement officials and to maximize returns.

Funding the Settlement Through an Excise Tax Increase. As noted earlier, the scheduled payments that would be made by the tobacco industry under the settlement are equivalent to a 63-cent-per-pack excise tax, adjusted for inflation. The settlement, however, would not simply impose such a tax on cigarettes; instead, it would levy scheduled payments on tobacco firms and allow any price increases to be determined in the market.

The market-driven price increases would be substantial because the scheduled payments themselves are substantial. Yet the actual price increase that would occur is uncertain. One plausible assumption is that retail prices would increase by about 63 cents per pack, passing through the costs of the settlement. That increase would result if there was a high degree of price competition among the tobacco firms. But price increases might be higher if the industry behaved more monopolistically.

Analysts agree that raising cigarette prices would be the single most effective deterrent to smoking. To avoid some of the uncertainty surrounding price increases under the settlement, one could instead impose a large excise tax increase on cigarettes. Such a tax could have an automatic adjustment for inflation that would increase the nominal tax per pack every year.

Levels of Funding for Public Health Programs. Nearly $100 billion would be paid under the settlement over 25 years to fund a variety of tobacco-related public health and research programs. Three-quarters of that money would pay for smoking cessation and prevention programs, media campaigns, and state and local government enforcement efforts. Such programs have never before been funded on that scale, and a significant part of the reduction in cigarette consumption that could be expected would be the result of the huge increase in public health efforts.

The funding of public health programs would not automatically grow by the full amounts implied by the settlement, however. Some of the funds might be diverted to other programs that were less directly related to the goal of reducing tobacco use. If key programs, such as clinical interventions to assist smokers who wanted to quit, were funded at very low levels compared with the levels that the settlement might have implied, then tobacco consumption would not decline by as much as CBO has projected.

Impacts on Tobacco Growers and Others. In 1996, tobacco was grown on over 124,000 farms in the United States. Including growers, the tobacco industry directly supports over 600,000 jobs for people who produce and deliver tobacco products. In addition, cigarettes and tobacco products contribute to the revenues of hundreds of thousands of retail establishments. The settlement would reduce the demand for cigarettes, which in turn would probably reduce the incomes of many of those people. The economic impact of the reduced demand would be concentrated geographically in six southeastern states, which account for the vast majority of tobacco growing and manufacture in the United States.

Impact on the Costs of Publicly Funded Health Care. Without question, cigarette smoking increases the mortality and morbidity of smokers, and the treatment of smoking-related illnesses is costly. Much of that cost is financed by Medicare and Medicaid, with additional amounts being covered by veterans' health care and other public health programs. The extent to which public health care costs might decline under the proposed settlement is unclear.

In the near term, the costs of Medicare, Medicaid, and other programs would be unlikely to change perceptibly as a result of the settlement. Under the most optimistic assumptions for the cost pass-through price scenario, the incremental decline in total cigarette consumption produced by the settlement might be as much

as 10 percentage points by the 10th year--but any savings associated with such a reduction would only be realized decades later. That is particularly true for the Medicare program, which primarily covers people over the age of 65.

If the settlement was effective in curbing teen smoking and if that outcome translated into permanently lower cigarette consumption as those people grew older, tobacco-related health care costs in the long run could drop significantly. However, reduced cigarette consumption might also increase program costs somewhat in the long run because people might live longer and use additional health care services during those years.

APPENDIX
LIFE-CYCLE ESTIMATES OF THE COST OF SMOKING

Life-cycle estimates provide somewhat contradictory evidence on the cost of smoking. Two major studies found that smokers had significantly higher medical costs over their lifetimes than did nonsmokers. A few other studies seem to draw the opposite conclusion, but their results may not be reliable.

According to a study by Manning and others, the medical costs of a young smoker over his lifetime that are not directly paid for by himself or his family are about 18 percent greater than those of a nonsmoker with the same characteristics.[1] A 1992 study by Hodgson is similar to the Manning group's study, except that Hodgson focuses on total medical costs rather than only those medical costs that are paid for by persons or programs outside the smoker's family. As a result, Hodgson's estimates of the excess medical costs of smokers are higher than Manning's estimates. Hodgson found that lifetime medical costs were 32 percent higher for male smokers and 24 percent higher for female smokers.[2]

However, Hodgson's study, unlike Manning's, did not account for the different characteristics of smokers and nonsmokers. Manning estimated that about 13 percent of the differences in the medical costs of smokers and nonsmokers were the result of characteristics other than smoking habits. Lowering Hodgson's estimates by 13 percent leads to lifetime medical costs that are 28 percent higher for male smokers and 21 percent higher for female smokers.

Hodgson also provided information on sources of funds for the excess health care costs of smokers. According to his study, private health insurance pays for most of the excess costs of smokers, with Medicare and Medicaid paying for 7 percent and 11 percent, respectively, of the excess costs of male smokers. For female smokers, 15 percent of their excess costs are paid for by Medicaid. The estimated Medicare costs of female smokers were actually 3 percent lower than those of nonsmokers.

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1. Willard G. Manning and others, *The Costs of Poor Health Habits* (Cambridge, Mass.: Harvard University Press, 1991), pp. 77-78.

2. Thomas A. Hodgson, "Cigarette Smoking and Lifetime Medical Expenditures," *Milbank Quarterly*, vol. 70, no. 1 (1992).

In contrast, two studies by Leu and Schaub provide evidence that smokers might have lower lifetime medical costs than nonsmokers.[3] Data on health care costs from a sample of Swiss men showed that smokers in the sample had somewhat fewer physician visits and slightly more hospital days compared with nonsmokers. But those analyses may have limited applicability to the United States, where studies have shown that smokers have more physician visits and hospital days than nonsmokers.[4]

Another study by Barendregt and others using data from the Netherlands found that lifetime costs were 7 percent lower for male smokers and 4 percent lower for females.[5] However, that result does not discount lifetime costs to the present as the Manning and Hodgson studies do. Using a discount rate of 4.5 percent to 5.5 percent to measure the present values of medical costs reverses the conclusions of the Dutch analysis. Moreover, the study may understate the medical costs of smoking since it considered only five major categories of disease rather than a more comprehensive set of medical conditions.

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3. R. E. Leu and T. Schaub, "Does Smoking Increase Medical Care Expenditure?" *Social Science and Medicine*, vol. 17, no. 23 (1983), pp. 1907-1914; and Leu and Schaub, "More on the Impact of Smoking on Medical Care Expenditures," *Social Science and Medicine*, vol. 21, no. 7 (1985), pp. 825-827.

4. Dorothy P. Rice and others, "The Economic Costs of the Health Effects of Smoking, 1984," *Milbank Quarterly*, vol. 64, no. 4 (1986), pp. 489-547.

5. Jan J. Barendregt and others, "The Health Care Costs of Smoking," *New England Journal of Medicine*, vol. 337, no. 15 (1997).