Cigarette taxes as cigarette policy

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Introduction
The taxation of tobacco products is universal in the modern state. Wherever tobacco products are consumed, they are taxed. Further, while taxation policy varies widely from state to state, the taxation of tobacco products is almost always an important element of government policy toward tobacco and toward smoking. Tobacco taxation policy varies over time as well as cross-sectionally. For example, recent years have witnessed relatively sharp increases in tobacco tax policy in Canada and major efforts to create harmonisation of cigarette taxation policy in the European Community by substantial increases in tax for low income tax nations. Since the autumn of 1993, a substantial increase in the per package cigarette tax has been proposed by the Clinton administration as a major funding vehicle for comprehensive health care reform in the United States. Cigarette tax policy also serves as a window into social attitudes about smoking because cigarette taxation policies not infrequently reflect shifts in views about cigarettes and smokers.

The aim of this paper is to provide a policy context for reviewing what is currently known about the effect of cigarette taxes on smoking and what needs to be determined to provide an adequate factual basis for informed policy. In the first part of the analysis we discuss three different purposes of cigarette taxation and the relationship between each of these and the level of taxation that would be regarded as optimally appropriate. In this section we also probe the relationship between various purposes of taxation and theories of justice.

In the second part of the paper we discuss current knowledge about the behavioural effects of cigarette taxation. In this section we examine the impact of tax levels on the prevalence and incidence of smoking, as well as the impact of taxation and price changes on the behaviour of particular target groups such as young people, low income groups, and smokers with some intention of ceasing to smoke. We also discuss the collateral effects of smoking taxation on consumer behaviour and family welfare.

In the third section we discuss the behavioural processes that result in higher prices reducing cigarette consumption. We distinguish four different mechanisms and suggest ways to assess the relative impact of each. A concluding section summarises the research tasks we recommend to assist in framing cigarette taxation policy.

Three objectives of cigarette taxation
Government tax policy toward cigarettes can be intended to serve at least three objectives: revenue, efficiency, and deterrence. The generation of government revenue is the first purpose of taxation, both functionally and historically, in the modern state. Tobacco taxes, far from being an exception to this pattern, traditionally were classified as a "luxury" or "vice" tax, a category which is particularly susceptible to tax rates that are quite high in relation to total consumer cost of the product. Human vice, however defined, is a popular source of government revenue whenever the vice is not prohibited by the criminal law. The ideal behaviour from the standpoint of revenue motivated taxation is one which is popular but not sacred. As long as recreational chemicals are regarded as affordable by the general population, a relatively high tax burden is born with equanimity because the general social feeling is that these substances are not necessities of life. Such taxes on recreational chemicals can be socially justified whether or not the use of those chemicals imposes a social cost in excess of their untaxed price.

A second distinct goal of cigarette taxation is to raise the price of cigarettes to consumers to a level that fully reflects the social cost generated by their consumption. Under these circumstances, an efficient price means that cigarettes are purchased only by those for whom the net benefit of cigarette smoking is larger than the price of cigarettes, even when that price fully reflects the social cost of consumption. If balance between social cost and consumer price is the objective of the policy, the government does not wish to impose taxes unless external social costs exist, and the government would wish to cease taxing at the point where price reflects social cost.

One approach to the goal would be to set a tax so that the total revenue extracted would be equal to the total social cost generated. This can be characterised as an aggregate equality approach. A second goal would be to create a tax where the price of smoking is at the margin, so that the price paid by the smoker for the cigarette he least values will have a total price equal to the social cost of the additional cigarette. This kind of tax, called Pigovian taxation after AC Pigou (1962), will produce efficient consumption of cigarettes that only the cigarettes worth their full marginal social cost to the smoker are consumed. The amount collected by such taxes may be greater than the total external cost of smoking, because the tax...
necessary to raise the price of the cigarette at the margin will be collected on all cigarettes smoked.12
13
A third distinctive objective of cigarette tax policy might be to discourage smoking.12,13
When government decides to actively discourage a behaviour, taxation is a tool that exists to produce another reason not to purchase cigarettes with every increasing level of taxation until black market institutions have effectively nullified the relationship between the official tobacco tax and the effective cigarette price for most smokers.

These three different purposes of taxation implicate different definitions of what would be an optimal level of cigarette tax. They may also lead to different conceptions of what constitutes justice in tobacco taxation, although this is far from clear. The optimal level of a cigarette tax designed to produce efficiency that is which reflects the social cost of the cigarettes being smoked. Any higher tax is suboptimal because it discourages smoking among persons for whom benefits of cigarettes outweigh the costs, as shown by their willingness to pay a price that reflects the true social cost. Any lower tax would encourage smoking when the benefits to the smoker do not outweigh the total community cost.

This notion of efficiency as the optimum can be readily distinguished from revenue maximisation and deterrence rationales. If revenue is the objective, the ideal level of taxation is that which maximises the total amount of revenue the government realises. That this might discourage some smoking is a matter of indifference to government in a regime dominated by revenue maximisation concerns.

By contrast, a deterrence rationale suggests that the principal objective of taxation is to discourage smoking. A deterrence partisan rejects the whole notion of optimal levels of smoking as conceptually inappropriate to social policy toward an addictive drug. The supporter of a pure deterrence rationale to taxation would see no upper limit to the amount of tax that could be raised by tax policy toward an addictive drug. The supposition is that which maximises the total amount of revenue the government realises. That this might discourage some smoking is a matter of indifference to government in a regime dominated by revenue maximisation concerns.

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A further question concerns whether there are considerations other than governmental interest that should help determine a fair and appropriate cigarette tax. We have found no published reports on the jurisprudence of vice taxation, but our preliminary work recommends this as a complicated and important topic. One view would be that the taxed sale of cigarettes is unobjectionable at any level because it is a voluntary transfer of money under the conditions of full information. If it were not "fair" to the customer, he or she could always choose not to complete the transaction. Since there is no coercion by government, there should be no special concerns about the fairness of the tax on the activity.

Three objections are possible to this position. First, the negative economic consequences of cigarette taxes are not restricted to the people who purchase cigarettes and pay them. If spouses and children suffer economic deprivations because of the level of a cigarette tax, they have in no significant sense volunteered for this disadvantage.15 Second, the...
government's monopoly on cigarette sources and the fact that most active smokers are addicted to nicotine might suggest an element of unjust exploitation when taxes are increased just to raise governmental revenue. A third objection to taxes over the level needed to balance social cost is that this is unfairly burdening smoking as an activity instead of spreading the burden of supporting the government more evenly across citizens and activities.\(^{19,20}\)

The argument that non-smokers may suffer from taxes carries some weight, but little is known of the extent of the burden on innocent parties and thus about how large a concern this should be to tax policy. The "addiction/monopoly" argument has substantial appeal on first impression. If the deterrence rationale is put aside, raising taxes on smokers to exploit the inelasticity of their demand does seem problematic. But deterring smoking and reducing the amount that active smokers consume are legitimate counterweights to the exploitation of the addicted. Only if demand for cigarettes were totally price insensitive would the problem of state exploitation be a formidable argument for limiting taxes.

While the voluntary character of purchase does not render cigarette taxes immune from charges of unfairness, it remains an important aspect of the use of taxes that cannot be ignored in making judgments about the fairness of taxes. While prohibitions on smoking for particular areas or for minors attempt to force abstinence, taxes only encourage it.

Of the three motives for taxation discussed earlier, only the compensation for external social costs seems to provide a standard that might generate a particular level of tax as fair. A revenue standard imposes taxes until marginal revenue turns negative. That level of taxation would seem unconnected to any particular benchmark of fairness in taxation. The proper measure of a deterrence rationale is also wholly instrumental and thus unconnected to any measure of fairness in taxing.

Does a tax policy that restricts cigarette consumption to those who value it more than its social cost-adjusted price represent a reliable standard for a fair tax? The case can be made that such a tax represents the lower boundary of fair cigarette taxation, but it is difficult to argue that tax levels higher than compensatory for externality are unfair per se. The argument for seeing this standard as a lower bound for tax policy is that lesser taxes will encourage smoking even when the harm to non-smokers is larger than the value of the cigarette to the user. There may be some fairness value in holding the price at true social cost as a minimum at the margin, even if the money collected by taxation is not used to compensate those who pay the cost, although the rationale is not obvious.

But efficiency of this kind is an unconvincing upper limit of justice in cigarette taxation. First of all, governments impose many taxes on many activities that do not generate externalities. Taxing retail sales or value added to goods or services raises the price of goods beyond a market determined efficiency price, but this has not been the basis for regarding these taxes as unjust. Taxes that raise the price of cigarettes beyond efficiency have ample precedent in other tax policies. Real estate and gambling, to cite two examples, have been singled out for special taxes, and this is not regarded as clearly wrong as a matter of fairness.

The political system is usually accorded a substantial degree of discretion in deciding which activities of citizens should be used to finance the government and in what manner. There might be a basis for objecting if a particular tax means that one group in society—in this case smokers and their families—is paying a disproportionate share of the total cost of government. At what threshold this should become a concern is not clear. But one feature of this problem is worth noting. If revenues from cigarette taxes are earmarked for the benefit of smokers or their families, sums in excess of social cost can be collected and channeled back without creating an objectionable imbalance between benefit and burden, even if the tax greatly exceeds the per pack external cost of cigarettes. Assume a public policy that collects a surcharge of $0.50 per pack in cigarettes and uses the revenue to pay for the medical expenses of smokers and smoking cessation programs. This type of compulsory insurance may not be seen as desirable on other grounds, but it removes the objection based on the smokers' disproportionate scale of the general burden of government.\(^{19,20}\)

Current knowledge on behavioural effects of cigarette taxation

The central feature of a cigarette tax as a cigarette policy is the fact that higher cigarette prices reduce both the number of smokers (smoking prevalence) and the number of cigarettes consumed (the incidence of smoking).\(^{14,21}\) No controversy surrounds the basic effect of price on demand for cigarettes—after all, the effect of price on quantity is called the first law of demand by economists, not subject to the scepticism of any reasonable observer. The key behavioural uncertainty is about the extent to which increases in price reduce demand for cigarettes, an issue that economists describe as the "elasticity" of demand for cigarettes. If the demand for cigarettes is highly elastic, then relatively small increases in price will significantly reduce demand. The conventional way elasticity is measured is with a number that represents the extent to which a given price rise or fall will affect demand. If a 10% price increase will reduce demand by 10%, it is said that the elasticity of demand at this price is 1.0 (\(-0.10/0.10 = -1.0\); with the numerator of the fraction the percentage change in demand and the denominator the change in price). If a 10% price increase produces a 20% decrease in demand, then elasticity is expressed as 2.0 (\(-0.20/0.10 = -2.0\)).\(^{14-22}\) While the factors which make the demand for a particular product more or less
elastic may operate over a wide spectrum of prices, a specific measure of elasticity is derived from the comparison between demand at two prices.

PRICE ELASTICITY AND POLICY

There is no obvious relationship between elasticity of demand and the extent to which taxation is a desirable cigarette policy. As long as tax increases have some tendency to reduce demand, the tax can be increased to compensate for inelastic demand until the desired consumption pattern is achieved. From this perspective, the primary effect of low elasticity of demand is to increase greatly the revenue flow to government from a deterrent tax policy. But if tax increases generate negative effects that make them undesirable or are politically difficult to achieve, then relatively inelastic demand will limit the potential role of tax increases in policies intended to limit demand for cigarettes.

There are thus two situations where data about elasticity of demand are of direct importance in defining the appropriate role of increasing cigarette prices through taxation in a comprehensive tobacco policy. First, if there are political limits that constrain the amount by which prices and taxes can rise, then data on elasticity of demand tell observers how much reduction in the demand for cigarettes can be expected from achievable price/tax strategies. If cigarettes now cost $1.00 and only an additional dollar increase in price achieved by raising taxes can be achievable in the political process, an elasticity of −0.24 would show that the maximum reduction available in smoking incidence from this strategy is 24%. If that is less of a reduction than is required, some other methods of demand reduction will also be required.

The extent to which there are limits on the willingness of the political system to support tax and price increases and what those limits might be under different social and governmental circumstances are empirical questions that have not been closely examined in published reports on taxation. The variation in cigarette prices and taxes that can be observed cross-sectionally is much more substantial across-nationally than among the states in the United States (compare Worldwatch Institute 1992 with Tobacco Institute 1993); and the number of sharp variations over time in taxes and prices is much larger in the recent history of some foreign settings such as Canada. Close attention to historical patterns outside the United States would seem the best method of finding how much variability in cigarette taxes can be tolerated by the political system in different settings. Further, the history of tax proposals that fail as well as that of those that succeed must be studied in order to gauge the extent to which the political context limits tobacco taxes as a policy tool. These issues, and the others which comprise what may be called the political science of cigarette taxes, are important and neglected topics.

There is a second reason why tax and price increases might be properly limited, possibly requiring other forms of demand reduction policies. Such taxes may produce negative consequences for smokers or their families which might offset the benefits produced by the reduced demand. Furthermore, other negative social impacts might include the black markets encouraged by high levels of taxation and the criminogenic consequences of creating extensive black markets if they are formed as a result of high taxes.

While the economic pressures of high prices on drug addicts have been much discussed, there has not been sustained discussion of the negative effects of high cigarette prices on consumers or their families. However, the regressive nature of cigarette taxes is well documented. Some theoretical statements have been made about black market tendencies and their effects on social organisation, but the negative effects of tax increases have not received much attention.

Research opportunities for assessing the impact of cost increase on smokers, families, and black markets are best when large price increases happen relatively quickly. Statistical measures over time in such cases are less likely to confuse the effects of price with the multitude of other factors that can affect the economic well-being of smokers and their families. The interrupted time series design is appropriate for examining the effects of price changes, but a wide variety of effects should be the subject of inquiry. Our review of price impact studies leads us to conclude that social scientists examining price impacts should develop a much wider sense of relevant variables, the equivalent of peripheral vision in doing cigarette price impact research. The Canadian experience is one attractive candidate for studying price increases in an advanced industrial economy. Large relative price increases will probably occur over the long term in Spain, France, and other relatively low price cigarette nations in the European Community when such nations comply with a community mandate to harmonise domestic cigarette taxation.

The political tolerance for cigarette tax increases and the effects of such increases on consumers, families, and illicit markets are high priority research topics for determining the proper role of taxes in tobacco policy. Each question can best be explored with data from other countries.

THE EFFECTS OF PRICE ON SMOKING INCIDENCE

The existing research on elasticity of demand for cigarettes is surveyed here both because it is an important topic if tax increase should be limited and as an example of how providing an international review of policy research can be helpful. The strategy of this section is to use existing study estimates to see whether there is consistency in estimates of elasticity, and to contrast findings based on United States data with non-US studies of the same phenomenon.

The table reports aggregate data about elasticity of demand from the 17 post-1980
Price elasticity estimates in the United States: 17 studies published since 1980

<table>
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<tr>
<th>Range</th>
<th>Median</th>
<th>25th Percentile</th>
<th>75th Percentile</th>
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<td>−0.14 to −1.23</td>
<td>−0.45</td>
<td>0.30</td>
<td>−0.55</td>
</tr>
</tbody>
</table>

Sources: See Appendix.

estimates for the United States we found in published reports. The median estimate is −0.45, predicting a 4.5% decline in unit sales for each 10% increase in price. Half of the estimates are between −0.3 and −0.55, while the total range is from −0.14 to −1.23. Seven of the 17 estimates are between −0.4 and −0.49.

There are two indications that the average estimate reported in the table is in range and stable. First, there are two different types of data used for analysis of elasticity, and the two different approaches yield comparable estimates. The four estimates based on health survey research vary between −0.23 and −0.47 with a median value of −0.41, compared to the median of −0.45 for the 13 surveys based on statistical analysis of state-level cigarette sales over time and cross-sectionally.

This consistency across method is paralleled by a comparison of the US estimates with 11 foreign studies covering the United Kingdom, Europe, Austria, Republic of Ireland, Finland, Switzerland, and Canada. The range of these estimates is from −0.32 to −0.74, with the two middle values, −0.39 and −0.50, nicely bracketing the US median of −0.45. With quite different price variations and time periods, there is no reason to expect this sort of consistency.

The existing studies of price elasticities provide broad support for estimated effects close to the US median, but the studies do not provide either depth or detail on price effects on smoking. The analyses that use state-level sales cannot provide data on behavioural differences between different ages, genders, or social and economic classes. The survey-based inquiries can provide data on individual responses to different price levels and this holds the promise of projecting the impact of price changes on specific groups that are the targets of special policies, but there is only a thin layer of this work to date.

There are important reasons why teenagers may respond differently than adults to price variations, including income and resource differences and the fact that a smaller proportion of teenagers who might wish to buy cigarettes will be habituated smokers. Using US health examination data, Lewit et al computed an estimated elasticity of −1.44 for teenagers, over three times their estimate for adults of −0.42. These estimates come from the US Health Examination Survey over the years 1966–1970. They would indicate a stronger price effect in prevention of smoking among new smokers. In more than a decade after that finding was reported, we have found only one study which reported testing teenage elasticity: that of Wassermann et al in 1991.

That study used the US health interview surveys from 1970–1985 and reports a relatively small (0.23) estimate for adult and no significant price effect on teenagers. The issue is important and the discrepancy in findings in teenagers is large in both absolute and relative terms. More work on the effects of price changes on teenagers is a high priority of studies on price influences on smoker behaviour.

A further finding of some potential interest concerns the impact of social and economic class. One English study showed increasing elasticity with declining social class, from nil among social class 1 to −1.26 in the lowest class represented on the five point scale. This social class difference in price response was not found in one later study. A finding of differentiated social class response would be consistent with larger than normal teenage elasticity and might suggest that tax policy, with greater impact on lower socioeconomic groups, may balance out health information campaigns which seem to have a differential impact on higher classes.

If efforts to study price effects use survey methods, the differences in response of several different groups can be assessed directly. How effectively do high tax rates keep non-smoking or experimenting young persons from becoming habituated? Surveys that produce detail by age and smoking history can provide direct evidence on this question.

Existing studies have not infrequently tried to estimate differentially short run and long run impacts, usually finding larger long run effects. The long term/short term differential is far from established as fact. If it is true, however, the behavioural mechanisms that could account for this difference would include prevention of entry from higher prices having a cumulative effect and increased motives for cessation programmes over time. A third possibility, somewhat less plausible, is active smokers adjusting over time to lower cigarette volume over the long term. Panel studies over time where prices increase quickly can help sort out the behavioural impact that may explain long term increments in price effects. Some of the research tools used by commercial advertisers, such as focus groups of smokers and young persons, might prove to be effective in the search for specific price effects on discrete groups.

The existing data on cigarette costs and consumption can also be used to investigate the relationships between the cost levels from which price changes occur and the elasticity of demand among the general population and various subgroups, such as women, adolescents, and ethnic groups. At issue here is whether increasing cigarette costs produces a diminishing marginal returns phenomenon, where groups that have remained purchasers at high price levels show relatively inelastic demand responses to further increases. This is an empirical question that can be addressed in aggregate market terms with currently aggregated data and for target subgroups with panel or health survey data.
Behavioural processes that result in higher prices reducing consumption

The tax which raises product prices is a versatile tobacco policy tool that can reduce the demand for cigarettes in a variety of different ways. For that reason, it may well be that we currently know more about the extent of tax effects than about the nature of those effects. In this section we survey the variety of ways that tax policy may work to reduce cigarette consumption and discuss methods of determining what sorts of behavioural mechanisms account for the reduction in smoking that price increases produce.

While product prices do control access to cigarettes, the tax and price mechanism cannot be used to regulate the time, place, or manner of cigarette smoking directly. Taxes on tobacco cannot discriminate between smoking in the presence of others or in shared environments and private smoking which poses no threat to the smoke-free environments of other citizens. So other methods, perhaps including economic measures such as fines or incentives, must be used to effect policies that discriminate between potential smoking environments. If some forms of tobacco are more injurious to shared environments than others, then differential taxes can be used to discourage the more threatening varieties of tobacco.

The primary influence of cigarette taxes is to reduce the level of cigarette purchase and thus of cigarette smoking. The reduction of purchase achieved by raising the price of cigarettes may reflect any of four processes: prevention, reduction, cessation, and moderation of initial exposure. Prevention describes the influence of high prices in discouraging non-smokers from becoming smokers. Reduction describes the influence of price increases on those persons who continue smoking, but smoke less. Such reduction may not always generate health benefits if price effects result in stronger cigarettes being smoked to compensate for the reduction, or if the smoker adjusts the intensity of smoking for each cigarette smoked. There is some evidence of this kind of response when smokers switch to low tar and nicotine cigarettes. Cessation describes the influence of price increases on those active smokers who become non-smokers. By moderation of initial exposure, we refer to a process by which those young persons who do experiment with cigarettes smoke less often and increase their rate of smoking less quickly in high price than in low price environments. If this occurs, it should reduce the rate of habitual smoking of young smokers and make cessation somewhat easier for those young smokers who try to quit early in a smoking career. The above four processes exhaust the direct influences of price increase, but do not account for reduced consumption because of the diminished social status or physical availability of cigarettes, which may have in part been caused by direct effects of previous tax increases.

Existing studies of tax effects do not attempt to measure the extent to which reduced demand is caused by increased prevention, demand reduction, cessation, or moderation of initial exposure. The high elasticity attributed to teenagers may suggest some prevention, but teenagers are also relatively short of cash and not fully habituated smokers, so that differential elasticity may simply reflect those conditions.

The best way to subdivide and measure the behavioural effects of changes in cigarette prices is by panel studies of different types of smokers and non-smokers over time periods with large price fluctuations. Among the key issues for such studies is whether price increases significantly affect smoking onset among non-smoking young persons and what kind of youthful non-smoker is most influenced by price changes. If poorer teenagers and those less successful in school and work environments are relatively more price sensitive, this might compensate for the lower susceptibility of this group to persuasive appeals from authority figures.

Related to the issue of price as a smoking prevention mechanism is the question of which cigarette prices are the significant ones for non-smokers. In a two tiered price system with generic cigarettes available for half the cost of those that are branded and advertised, the non-smoker may be responsive to the prices of branded products while experienced smokers are more interested in the price of the generic product. If so, prevention could be maintained by ad valorem taxes that favour low sales price products. If the new smoker is a prime candidate for discounted generics, then prevention efforts would more directly depend on the price of the cheapest available product and unit taxing should be favoured.

Panel studies that cover substantial price changes can tell us which groups of non-smokers notice cigarette prices changes and whether these groups are influenced by other prevention programmes. Panel studies of smokers’ responses can estimate whether they account for most of the short and long term decline in cigarette sales or whether there is a large residual effect that is attributable to prevention in the short and long term aggregate impact of price movements. Panel studies of smokers can also apportion effects between reduction and cessation and examine whether low price off-brands and generics influence either effect.

The final use of panel studies that bracket large price changes is to address the impact of price on smoking environments. It may appear sometimes suggested that price increases are a smoking deterrent to cigarettes among different income groups and family types. The study of whether and to what extent increased cigarette prices have negative effects on smokers and their families turns out to be a central issue in determining the appropriate role of taxes in a tobacco policy package. If taxes do not carry significant negative side effects, they should have a preferred position to both persuasion and coercion as state instruments of preventing the onset of smoking and encouraging persons to stop smoking. But substantial negative effects on family and child welfare would counsel a more restrictive role for the sub-
Cigarette taxes as cigarette policy

Panel studies are not the only way to study the experience of high cigarette prices. Comparative studies in high and low tax environments may help determine whether high prices affect the pattern of experimental smoking among young persons in ways that make cessation of smoking easier. If those experimenting with cigarettes tend to smoke less in high price settings, this not only discourages further smoking, but it also makes it much easier for the fledgling smoker to discontinue. The possible lower intensity of early smoking experience could be explored by interviews with young adults on the amount of early smoking and the ease of quitting.

What will be needed to explore many of these important policy issues is a shift in both methodology and disciplinary perspective from the tax and price studies that have been done to date. The methodological focus should shift from aggregate consumption data to surveys that reveal the behaviour of particular groups, highlighting the variance in cigarette consumption behaviour by ethnicity, gender, age, and socioeconomic status. This will be necessary to study the nature of price effects and to determine the collateral effects of cigarette prices on consumers and their economic relations. The survey is an indispensable instrument of the study of the differential responses of different groups to policy changes.

From the standpoint of academic disciplines, the work of the economist in studying price effects should be augmented with studies by survey sociologists, social psychologists, and ethnographers. This will be a major change from prevailing patterns in recent years. Many psychologists study smoking, but such work is typically limited to measurement of the effectiveness of treatment programmes for smokers or persuasion and smoking education.

The social psychology of cigarette policy effects has not been investigated. Health surveys have been used to identify differences, but survey sociologists have not analysed or supplemented these survey data. An interdisciplinary programme of survey research is a promising instrument for gaining knowledge on key policy goals.

Conclusion: toward a policy research agenda

This analysis has suggested two new research topics of central importance in determining the proper role of tax induced price increases in comprehensive cigarette policy. One topic is the practical upper limit on cigarette taxes and prices in the American political system of the 1990s and beyond. How much room for increase exists in the state and federal policy environment of the near future?

The second question is the negative effects of high tobacco taxes on the economic units that pay such taxes. By negative effects we mean not merely the revenue transferred and alternative consumption foregone by smokers, but the impact of these expenditures on family stability and family and child welfare, particularly among low income groups. It is time to move beyond determining that vice taxes are regressive to investigating the impact of expenditures on high priced cigarettes for low income consumers.

We regard these two questions as particularly important because, if high taxes are politically feasible and do not generate substantial collateral social costs, then taxes should have a preferred position among other policies to achieve prevention, reduction, and cessation. Taxes should be preferred to coercive measures of equal influence because they generate less constraint than prohibition and stigma. They also generate revenue. And the expenditures from revenue collected by such taxes can be directed at benefits to smokers as a group rather than the general population.

The public funding of cessation therapies or the treatment of smoking related diseases are two examples of benefit targeting.

Whether major efforts should be devoted to estimating the elasticity of demand for cigarettes depends in large part on what we find out about the feasibility and social costs of high cigarette taxes. If the sky is the limit on tobacco taxes from both a political and family welfare perspective, low elasticity could be countered with ever higher taxes until the proper level of reduced consumption was achieved.

But even if general levels of elasticity move from centre stage in policy research, the differential responses of different groups to such increases will remain an important issue. The reaction of different age, gender, ethnic, income, and smoking experience groups can tell us much about the nature of price effects. It also can tell us where supplemental methods of prevention and cessation incentives may be most needed.

There are two further research undertakings that deserve priority in policy research on taxes. First, large increases in cigarette prices should be examined in detail whenever and wherever they occur. Canada is one research site with a recent history that demands a close impact study, one that generates reliable data on smuggling and other tax evasion strategies. The low price nations of the European Community may soon experience large increases as part of a tax harmonisation programme in the EC. Theories or projections are not acceptable substitutes for the empirical knowledge that analysis of real changes in cigarette prices can produce.

Second, major governmental funding should support a large health survey undertaking with an emphasis on adolescents and young adults. The most important groups for smoking prevention and early career cessation effects have also been the least documented groups in studies of policies like taxes and prices.

A final point about this paper concerns the relationship between the policy analysis exercise reported in the first section and the first two research priorities in this conclusion. The proposal for studies of the practical limits of cigarette taxation and of the collateral impacts...
of high taxes is not only new to the field we were surveying, it was news to us as well. The key topics that emerged from this analysis did not play an important role in our preliminary framework. That this methodology could generate new priorities for policy research is significant evidence of its value.

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Appendix: Survey of price elasticity estimates

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<th>Reference</th>
<th>Country/group studied</th>
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<td>1955-1975</td>
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<td>1985</td>
<td>Mullahy39</td>
<td>USA</td>
<td>-0.47</td>
<td>1979 Health Interview Survey, by sex</td>
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<td>1985</td>
<td>Radfar41</td>
<td>UK</td>
<td>-0.23 (SR)</td>
<td>Quarterly aggregate sales data</td>
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<td>1986</td>
<td>Baltagi and Levin44</td>
<td>USA</td>
<td>-0.14</td>
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<td>Porter44</td>
<td>USA</td>
<td>-0.27</td>
<td>Time-series aggregate, 1947-82</td>
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<td>1986</td>
<td>Godfrey44</td>
<td>UK</td>
<td>-0.56</td>
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<td>1986</td>
<td>Wergottor and Kunze45</td>
<td>Austria</td>
<td>-0.54</td>
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<td>1988</td>
<td>Chaloupka46</td>
<td>USA</td>
<td>-0.26 (SR)</td>
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<td>1987</td>
<td>Becker et al47</td>
<td>USA</td>
<td>-0.40 (LR)</td>
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<td>WHO48</td>
<td>Pan-Europe</td>
<td>-0.38</td>
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<td>Chaloupka and Saffer49</td>
<td>USA</td>
<td>-0.28</td>
<td>Pooled time-series of state cross-sections 1973-85</td>
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<td>1987</td>
<td>Pekurinen and Valtonen49</td>
<td>Finland</td>
<td>-0.35</td>
<td>Time-series data, 1952-84</td>
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<td>1987</td>
<td>Townsend60</td>
<td>UK, by social class</td>
<td>+0.15 (SC1)</td>
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<td>1988</td>
<td>Godfrey and Maynard61</td>
<td>UK</td>
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<td>1956-84 aggregated sales data</td>
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<td>1990</td>
<td>Becker et al62</td>
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<td>-0.75 (LR)</td>
<td>1955-85 aggregated state sales data</td>
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<td>1990</td>
<td>Canadian Tobacco Manufacturers' Council63</td>
<td>Canada</td>
<td>-0.74 (est)</td>
<td>1973-88 aggregated sales data; industry estimates</td>
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<td>1991</td>
<td>Wasserman et al64</td>
<td>USA</td>
<td>-0.23 (adult)</td>
<td>NHIS health survey data 1970-1985 finds no signif. relationship between price and consumption for teens</td>
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<td>Flewwelling et al65</td>
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<td>-0.25 to -0.35</td>
<td>Multiple time-series sales data 1980-1990; special attention to 1989-90</td>
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<td>1992</td>
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<td>-0.49</td>
<td>Per capita aggregated sales, 1955-1988</td>
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<td>Keeler et al67</td>
<td>California</td>
<td>-0.3 to -0.5 (SR)</td>
<td>Monthly time-series consumption data, 1980-90</td>
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</tbody>
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* Note: In addition to the references cited above, several estimates of price elasticity were collected as secondary material from United States Department of Health and Human Services, Pekurinen, and World Health Organisation.

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Cigarette taxes as cigarette policy


