ECONOMIC ASPECTS OF SELECTIVE EXCISE TAXATION, WITH SPECIAL REFERENCE TO TOBACCO TAXATION

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The purpose of this essay is to describe the central economic aspects of excise taxation, particularly as this form of taxation pertains to the taxation of tobacco products. The first section provides some background information on the taxation of consumption in general and of tobacco in particular. The following four sections explore the main elements of the economic aspects of excise taxation. The first of these topics to be examined, in Section II, concerns who actually pays the revenues that are collected by government. Federal and state governments presently collect about $8 billion from the taxation of tobacco products. The economic analysis of incidence seeks to determine just how the burden of this tax, or, more generally, of any tax, is likely to be borne by people in their different capacities as consumers, as workers, and as investors.

The second main topic in the economic analysis of excise taxation explores the possibility that the burdens imposed on people by a selective excise tax will exceed the amount of revenue collected by government. This possibility is described as excess burden, with

the adjective used to indicate the possibility that the loss to taxpayers may exceed the revenues collected by government. Excess burden, then, represents a form of waste produced by a particular method of taxation, and Section III of this essay describes what is meant by excess burden and explains how the presence of excess burden is generally seen as an argument for the general as against the selective taxation of consumption.

The one line of argument that lends support to the use of selective excise taxation is what is referred to as corrective taxation, and this topic is examined in Section IV. The argument for corrective taxation is based on the possibility that people may undertake some activities for which they do not bear the full cost, because some of that cost is borne by other people instead. In such a setting, a properly chosen excise tax is one possible means of getting people to take into account the full cost of their activities, though it is not the only means of doing so, nor is it necessarily the best means. For example, if people's consumption of alcoholic beverages imposes costs on others, as through an increase in automobile accidents, an excise tax on those beverages might be seen as a means of placing the cost of those accidents on the consumers of those beverages.

The general idea of corrective taxation is one thing, its applicability to any particular case is another. The fifth and final part of this essay will

examine the applicability of the theory of corrective taxation to the consumption of tobacco products. In this regard, there have been a number of claims that cigarette smoking entails a social cost or loss on the order of $75 billion annually, through such things as lost production and higher medical expenses. Section V will examine the applicability of the theory of corrective taxation to the consumption of tobacco products. (A brief annotated bibliography will follow the essay.)

I. General and Selective Consumption Taxation

There are many particular ways in which governments tax consumption, but these various ways are commonly collapsed into two main categories: general and selective taxes. The general taxation of consumption has received increasing attention in recent years, mainly out of a growing recognition that the American system of income taxation taxes saving too heavily relative to consumption. Income that is saved is taxed twice, once when it is earned and again when it earns interest. By contrast, income that is consumed is taxed only once, when it is earned. Such a tax penalty on saving reduces our rate of capital accumulation and, hence, retards our economic progress. Placing more emphasis on the taxation of consumption would represent an approach to taxation that would not impair incentives to save and to invest.

Within the revenue system of the federal government, the taxation of consumption could be instituted either by allowing people to deduct their saving in arriving at their taxable income or by exempting interest income from the base of the personal income tax. Alternatively, some people have looked to the value-added method of tax collection, which in the way it is commonly administered in many nations is essentially equivalent to a general tax on consumption. Relatedly, some people have proposed to replace the present federal tax on corporation income with a tax on value added, under which firms would pay a tax based on the difference between the value of the products a company sells and the amount it spends for its various inputs.

General taxes on consumption are also imposed at the state level of government through general sales taxes, which are imposed by 45 states, and at rates clustering in the range of from four to six percent. As sales taxes are administered in the United States, they are not truly general taxes on consumption because some important categories of expenditure are commonly exempt from the tax base. Most personal services are exempt, as are expenditures on housing. Food purchased for consumption at home is also frequently exempt from the tax, as are medicines, clothing, and utilities, although there is much variation among the states in the particular exemptions they allow. Despite the existence

of significant exemptions, the general sales tax is still so broadly based that it is essentially a form of tax that is imposed nondiscriminatively among items of consumption.

In contrast, selective excise taxation involves the discriminatory taxation of particular items of consumption; whereas a general tax is imposed equally on all (or most) items of consumption, a selective tax discriminates among items of consumption. Selective excise taxes are imposed on either an ad valorem or a specific basis. With the ad valorem basis, the tax is expressed as a percentage of the value of the product. This type of excise tax is represented, for instance, by the federal government's taxation of air travel at five percent and telephone service at six percent. With the specific basis, the tax is expressed as a particular amount per quantity unit. For example, the federal government taxes distilled spirits at $10.50 per gallon, beer at $9 per barrel, and cigarettes at $8 per thousand (or 16 cents per pack of 20, up from 8 cents per pack before January 1, 1983).

State governments also impose a variety of selective excise taxes, and make use of both the ad valorem and specific methods of assessing liability. All states impose selective excise taxes on the consumption of tobacco products. These taxes take a variety of forms. Smoking tobacco and chewing tobacco are taxed in

about half the states, as are cigars. Tax liability on these products is commonly assigned as a percentage of the wholesale value of the product, and with most of these rates ranging between 10 and 40 percent. A few states tax cigars at a piece rate, and with this rate generally ranging between ½ and 2 cents per cigar in most of those states.

All states tax cigarettes, and, with the exception of Hawaii which taxes cigarettes at 40 percent of wholesale value, do so at a piece rate that, when expressed in terms of an amount per pack, typically clusters in the range of 10 to 20 cents. A few states exceed 20 cents per pack, and a number of states are considering tax increases. (At least 13 states have increased their cigarette taxes since 1980.) In a number of states, then, the combined federal and state tax on cigarettes is nearing 40 cents per pack. If a pack of cigarettes sells for $1.20 in such a state, the price net of tax is 80 cents. In such a case, the excise tax on cigarettes will have amounted, in ad valorem terms, to a 50 percent rate of tax, which is about ten times the general tax burden on consumption under the general sales tax.

Despite the strong discrimination among types of consumption under selective excise taxation, with cigarette taxation being one prominent illustration, selective excise taxation is actually a weak source of revenue. The federal government's taxation of

tobacco generates in the vicinity of only one-half of one percent of federal revenues. And all federal excise taxes generate only about three percent of total federal revenue. Although the situation varies from state to state, for all states taken together the taxation of tobacco generates only about three percent of total state tax revenues, which itself is only about one-half of the total revenues actually collected by the states. And all selective excise taxes, excluding the tax on gasoline, which is really an indirect method of charging road users for highways, generate only about 10 percent of total state tax revenues and only about 5 percent of all state revenues from all sources.

II. Incidence of a Selective Excise Tax

If various governments, federal and state, collect in the vicinity of $8 billion annually through taxes on tobacco, there must be particular individuals who consequently have $8 billion less available for their own uses. The question of incidence concerns just how and from whom this reduction in disposable income takes place. In principle, there are two alternative ways in which an excise tax might be borne. The price that consumers pay for the product could increase, and this increase in price is commonly referred to as forward shifting. In this case the tax would be borne by people according to how much of the product they consume.

Alternatively, the prices received by producers--workers and investors--could fall, and this decline in earnings is commonly referred to as backward shifting. Whether an excise tax increases the prices consumers pay or decreases the prices workers and investors receive, or the degree to which these two effects are mixed, depends on a number of circumstances, as I shall discuss below.

In any case, the problem of incidence is to determine the effect of the tax on the prices that consumers pay and producers receive. This problem can be characterized with reference to the arithmetical illustration I used above (p. 6). Suppose cigarettes are taxed at 40 cents per pack and sell for $1.20, which means that producers receive 80 cents per pack. The problem of incidence is to gauge what these prices would have been in the absence of tax. If the price of cigarettes should fall to 80 cents upon removal of the tax, it will be consumers who bear the burden of the tax. The tax raises the price consumers pay but does not affect the price producers receive. But if the price should remain at $1.20 after the tax is removed, it will be producers who bear the burden of the tax. In this case, the tax lowers the price producers receive but has no effect on the price consumers pay. And should some intermediate price between 80 cents and $1.20 result, the tax will have been shared by consumers and producers. For example,

should the price fall to $1 upon removal of the tax, consumers will pay 20 cents less per pack and producers will receive 20 cents more. In this case, the burden of the tax will have been borne equally by consumers and producers.

It is relatively easy to see why a selective excise tax will most typically be borne fully by consumers in a competitive economy. In such an economy, producers are free to choose where they will employ their labor and capital, just as consumers are free to choose where they will spend their incomes. A selective excise tax, in contrast to a general tax on consumption, implies that there will be many untaxed products in the economy. If the selective excise tax is to be borne by producers through their receipt of lower wages and dividends, there must be some reason why those producers do not reemploy their labor and capital in the myriad other, nontaxed industries where the returns are higher.

So long as people are free to employ their labor and capital where they choose, they will tend to shift from lower to higher paying employments in response to an excise tax. Hence, the imposition of a tax on the output of a particular industry will not be paid by labor and capital employed in that industry, because resource owners will choose to shift to other, nontaxed employments, should companies in the industry whose output is taxed attempt to make those resource owners absorb

the tax. Any such shift in the structure of production that results will, of course, reduce the output of the product subject to tax. With less output being produced, the price of the product will rise, so consumers will buy less of the product. This means that there will be less labor and capital employed in producing the product than would have been employed in the absence of the tax.

How much consumers will reduce their purchases in response to the tax-induced rise in price is something that is characterized by what economists call the elasticity of demand. The elasticity of demand is a ratio, and it is equal to the percentage change in the amount of a product people purchase divided by the percentage change in the price people have to pay. Demand may be elastic, inelastic, or unitarily elastic, according to whether this ratio is more than, less than, or equal to one. Cigarettes are commonly thought to be in inelastic demand. This means that the rate at which people decrease their purchases in response to a rise in price is less than the rate at which price increased. Therefore, consumers will spend more on the product after the rise in price, even though they are buying less of it. For example, an inelastic demand equal in value to ½ would mean that a tax that increased the price of cigarettes by 20 percent would reduce the number of packs people buy by only 10 percent.

Any tax-induced reduction in the amount of a product

people buy will also call forth various economic adjustments, and these adjustments will generally entail some cost to accomodate the resource reallocations that will be required. A cigarette tax will not just reduce the amount of cigarettes people want to buy, but will also reduce the amount of producer services that companies will want to hire. Among other things, companies will want less tobacco, less warehouse space, and less of various types of labor. And it makes no essential difference whether these various changes are described from the static perspective just used or from a more dynamic perspective that allows for growth through time. Within this latter perspective, the amount of employment might not decline, but it will increase less rapidly than it would have increased had not the tax been imposed. Warehouses might not become vacant, but warehouse capacity will be expanded less rapidly than it would otherwise have been expanded. In these and in numerous other ways, a variety of economic adjustments will take place because the tax-induced rise in price makes people less willing to buy the product. These adjustments will be costly for many of the people involved, and the greater the elasticity of demand, the greater will be the reduction in consumer purchases in response to any given tax increase, and so the greater will be the adjustment cost.

The case of forward shifting is considered by

economists to be the standard case for selective excise taxation. The case of full backward shifting is one of those things that is logically possible, but is without any practical significance. Backward shifting would result if the labor and capital employed in a particular industry could be employed only in that industry. For this to happen, land that was used to grow tobacco would have to be incapable of being used for anything else, including serving as sites for warehouses, sanitary landfills, and the like, in addition to being incapable of growing other kinds of crops. It would likewise require that warehouses could be used to store tobacco, but could not possibly be converted to anything else, as well as requiring that people who work at the various aspects of growing tobacco and producing and distributing cigarettes could do nothing else. Only under these imaginable but inconceivable set of circumstances would a selective excise tax be borne fully by producers of the product being taxed.

Although the extreme degree of specialization in production that is required for full backward shifting does not exist, it is possible that some degree of specialization in production might be present. Some land may be better suited for growing tobacco than for growing other things; some people may be more talented at grading tobacco than at doing other things; some warehouses may be more efficiently used to store tobacco

or cigarettes than to store other things. To the extent such a partial specialization exists, a selective excise tax will work to some extent to reduce the earnings of workers and investors. This will be so because such workers and investors will not be able to get the same return by seeking employment in the nontaxed industries as they would be able to get in the absence of tax in their present employment, because they are not equally adept at both types of employment. However, any such specialization will generally operate more strongly over shorter periods of time than over longer periods. The longer the passage of time, the greater the opportunity people will have to reorient both theor own talents and the specific forms of their capital investments. This means that in the period of time immediately following the imposition of an excise tax, or an increase in a presently existing tax, the share of the burden that will be borne by producers is greater than it will be after more time has elapsed. Ultimately, little if any of the burden of an excise tax will be borne by producers; that burden will be borne by consumers.

III. Excess Burden of Selective Excise Taxation

The revenues government collects through an excise tax are generally paid by consumers of the taxed products. The roughly $8 billion that various governments in the United States collect from excise taxes on tobacco

products are generally paid for by consumers of those products, whose disposable incomes are reduced by $8 billion by the tax. Typically, however, the burden that an excise tax imposes on consumers will exceed the amount of revenue that governments collect. If governments collect $8 billion from consumers of tobacco products, the total burden borne by those consumers will exceed $8 billion. This additional burden beyond the amount of revenue governments collect is referred to as excess burden. (Before describing the nature of excess burden, I should perhaps note that this topic, which is an important element in the economic literature on excise taxation, and, indeed, in the literature on taxation generally, is a relatively abstract topic; nonetheless, I shall try to portray the central ideas as simply as I can, although by its very nature the subject is more abstruse than other topics in excise taxation.)

Suppose that cigarettes would sell for 80 cents per pack in the absence of an excise tax, and that people would buy 25 billion packs per year at this price. On of the central features of a competitive market economy is that the price of a product tends to equal its cost of production. Should price be less than cost, producers will choose to employ their labor and capital elsewhere, where the returns are higher. The decrease in industry output that would result would, in turn, bring about an increase in the price of the

product, and this increase will continue until cost is covered. ("Cost" as used in economics includes the payments necessary to attract equity investors, unlike the use of that term in accounting and law.) And should price exceed cost, producers will earn more on the labor and capital employed in the industry in question than on that employed elsewhere, so labor and capital will be attracted to the industry in question. The expansion in output that thus results will bring about a decline in price until price equals cost of production.

But what is cost of production? What does it mean to say that the cost of a pack of cigarettes is 80 cents? One of the central propositions of economic analysis is that in a competitive economy, the cost of producing a unit of a product tends to equal the value that consumers place on the other products that must be foregone to produce the product in question. To say that the cost of producing a pack of cigarettes is 80 cents, then, is equivalent to saying that the value of the other output that could have been produced had the cigarettes not been produced instead is itself worth 80 cents to consumers. Therefore, in the absence of excise tax in a competitive economy, the price that consumers must pay for one product is equal to the value they place on the alternative output that could have been produced by the resources that were used instead to produce the product in question.

Now consider the imposition of an excise tax on

cigarettes of 40 cents per pack, which raises the price to $1.20 per pack. Suppose consumers respond to the rise in price by reducing their purchases to 20 billion packs per year, meaning that they now spend a total of $24 billion ($1.20 x 20 billion) in buying cigarettes. Of this amount, $8 billion ($0.40 x 20 billion) is collected in tax and the remaining $16 billion ($0.80 x 20 billion) is received by the various providers of labor and capital engaged in the production of cigarettes. Consumers must now pay $1.20 for cigarettes, while the cost of the cigarettes, which is equivalent to the value of the other output that must be sacrificed to produce additional cigarettes, remains at 80 cents. The key to excess burden resides in this divergence between price and cost that the excise tax creates.

After the tax is imposed, consumers pay $1.20 for a pack of cigarettes which costs, in terms of alternative output foregone to provide the resources to produce the cigarettes, only 80 cents. This situation means that the value to consumers of an additional pack of cigarettes is $1.20, while the value of whatever other output they would have to give up to get those additional cigarettes is only 80 cents. Consumers would be better off by a shift of resources into the production of cigarettes until output had increased sufficiently to lower the price that people would be willing to pay for cigarettes to 80 cents. The excise tax makes consumers worse off, beyond the $8 billion

tax extraction, by the extent to which the value consumers place on additional cigarettes exceeds the cost of producing those additional cigarettes. This magnitude is the excess burden of the excise tax.

It is possible to assess empirically the extent of the excess burden of any particular excise tax. To explain how this can be done, it is very helpful to construct a simple diagram of the situation at hand, which is done in Figure 1 below. There, the curve labeled D describes the number of packs of cigarettes that consumers would buy per year at various possible prices. And for any given quantity they would purchase, the associated price indicates the value of additional cigarettes to consumers. The cost of producing cigarettes is assumed to be 80 cents, and the tax is assumed to be 40 cents per pack. In the absence of tax, cigarettes would sell for 80 cents and people would buy 25 billion packs annually, and would spend $20 billion in the process. The tax raises the price to $1.20, and consumers respond by reducing their purchases to 20 billion packs. Consumers now spend $24 billion per year, of which producers receive $16 billion and governments collect $8 billion.

The total amount of the excess burden associated with the reduction in the output of cigarettes from 25 billion to 20 billion packs per year is illustrated in Figure 1 by the shaded triangular area, abc. This

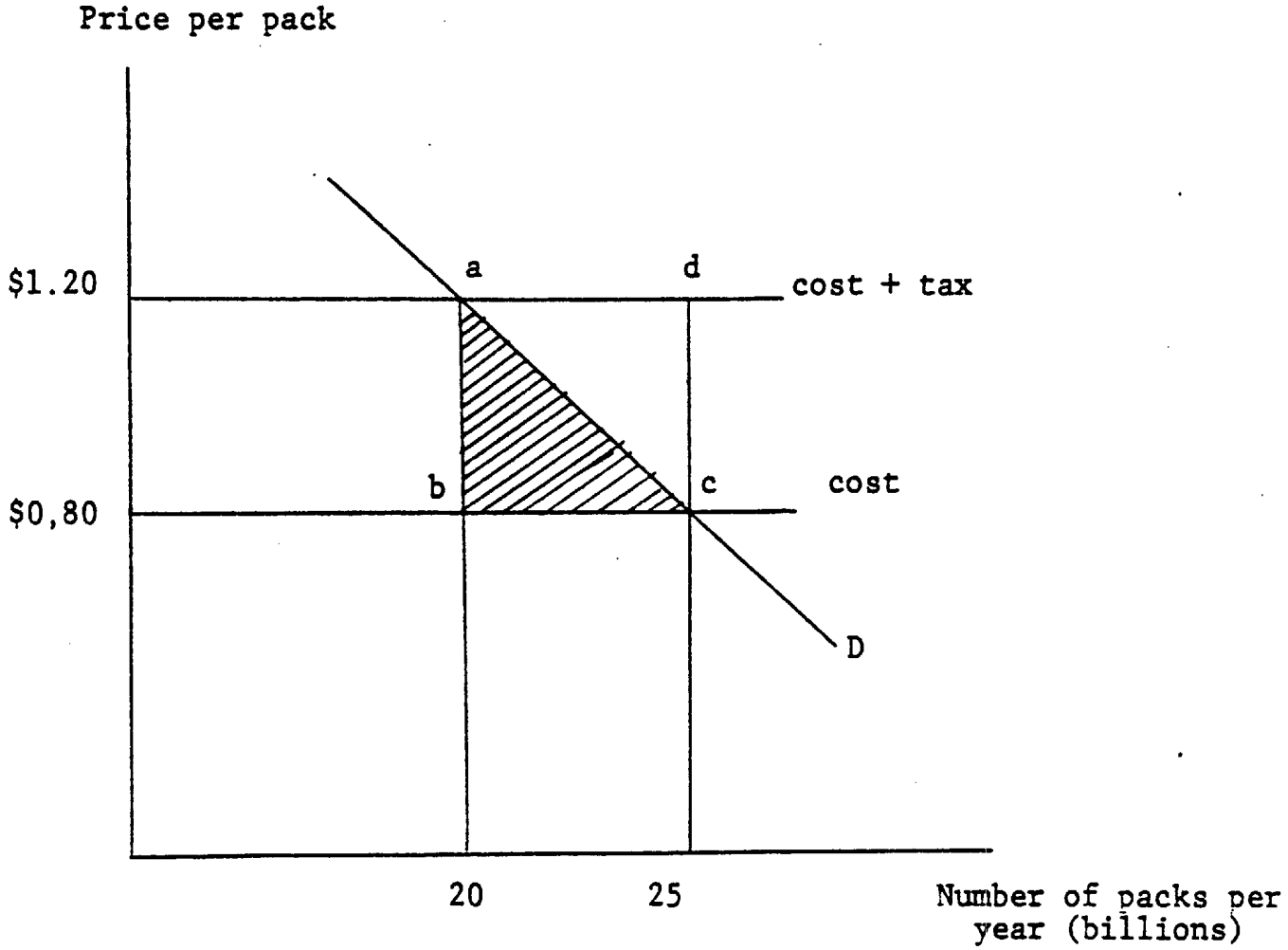

Figure 1--Illustration of the Excess Burden of an Excise Tax on Cigarettes

amount can be assessed empirically. If the demand curve were linear between the two prices and quantities, the excess burden could be measured exactly, and would be equal to one-half the rectangular area abcd. More generally, one-half of this rectangular area serves as an approximation to the actual excess burden, even if not as an exact measure. The rectangular area is, of course, equal to the change in price brought about by the tax miltiplied by the resulting change in quantity. In the illustration at hand, the excess burden, E, is

$$E = \tfrac{1}{2}(\$0.40)(5 \text{ billion}) = \$1 \text{ billion}.$$

In this case, the excess burden, which is a measure of the waste associated with the use of the selective excise tax, is equal to 12.5 percent of the revenues the tax produces. For each dollar governments collect in tax, consumers of cigarettes lose $1.125--$1 of which is collected by government and $0.125 of which simply evaporates, as it were, because the tax induces a shift of resources away from the production of products that consumers value more highly into the production of products that they value less highly. And as a general principle, the excess burden of an excise tax on any product can be computed by applying the formula

$$E = \tfrac{1}{2}\left(\frac{T^2 DX}{P}\right),$$

where T is the amount of the tax, D is the elasticity of demand, X is the output of the product, and P is the

price of the product. Excess burden, then, rises with the square of the amount of tax, and also with the elasticity of demand.

IV. Theory of Corrective Taxation

Selective excise taxes, then, impose especially heavy burdens on those people who choose to consume those products that are subject to tax. Not only do these people pay tax that consumers in general do not pay, but also they bear an additional, excess burden due to the tax. Selective excise taxation involves a discrimination against particular people within the citizenry, namely those people with particularly strong preferences for those products that are subject to tax. Hence, such taxes have traditionally been regarded by economists as having little to recommend them on grounds of principle.

The strongest recommendation for the use of excise taxes has tended historically to be ones of convenience or politics. Excise taxes have commonly been levied on imported goods, because the entry of goods from foreign countries generally funnels through ports, airports, or along certain highways, and which makes such goods relatively easy to tax. Furthermore, there are a number of instances where the consumption of certain types of products are or have been regarded with disapprobation by some significant or dominant classes

within society. History is filled with examples where those dominant classes have attempted to proscribe such consumption. It is also filled with examples where, perhaps out of a pragmatic recognition that proscription is impossible, or perhaps out of a judgment that there is insufficient political support for proscription, such consumption has simply been taxed.

The imposition of excise taxes on such products is referred to as sumptuary taxation. This form of taxation essentially represents a transfer of income from the disfavored classes of consumers, who pay higher taxes, to the favored classes, who pay lower taxes. (This is most easily seen by assuming that a state that abolished its sumptuary taxes would increase the rate on its general sales tax so as to maintain its revenues.) This use of taxation as an expression of moral disapprobation can be found in numerous forms of excise taxation, including those on tobacco, liquor, playing cards, theater admissions, musical instruments, cameras, jewelry, furs, and pool tables, among numerous other items that have at one time been taxed or are still being taxed. Such taxes are rarely rationalized forthrightly on the basis of morality these days. The continuance of such taxes is perhaps more a matter of politics. It is generally easier politically to mount a successful opposition to the imposition of a proposed tax than it is to mount successful support for the

repeal of an already existing tax, mainly because the entire apparatus of government has a pro-tax bias, and the support or opposition of this apparatus is an important element in the success or failure of different possibilities for tax legislation.

Central Idea of Corrective Taxation. There is one main line of economic reasoning that lends support to, or at least provides a rationalization for, selective excise taxation. This is what is referred to as the theory or principle of corrective taxation. In such cases the very raison d'être of an excise tax is its ability to discriminate among types of consumption, thereby reducing the amount of certain products that are consumed, or possibly altering some of the characteristics or attributes of those products.

The rationalization for the imposition of a selective excise tax on the consumers of particular products, as against imposing burdens on the general class of consumers, revolves around the possibility that in some cases the market price of a product may not fully reflect its true cost of production. In such cases, the true cost of a product will exceed the price consumers have to pay for it. These omitted or neglected aspects of cost are commonly referred to as external costs, to indicate that they are costs that are not reflected in the normal market transactions between buyers and sellers.

Numerous examples have been developed in the

economics literature to illustrate the principles of corrective taxation. Consider, for example, the production and consumption of distilled spirits. The price of whiskey, in the absence of tax, will include the cost of using such resources as land, labor, corn, malt, oak, glass, and paper, among other things, as well as the payment required to induce investors to provide the necessary capital. When someone buys a bottle of whiskey, the payment compensates the owners of those resources that have been engaged to produce whiskey. However, the consumptin of whiskey might also involve the use of other resources, the cost of which is not reflected in the price of whiskey.

For example, some consumers of whiskey, or distilled spirits more generally, or any other alcoholic beverage for that matter, might injure or kill someone while they attempt to drive home. Such damage to persons and property is also a cost associated with the consumption of whiskey, only it is not reflected in the price of the product. A person who pays $5 for a bottle of whiskey pays for the corn, glass, and so on, but does not pay for the various damages inherent in the injuring or killing of a third party. The imposition of a tax on the consumption of whiskey, as well as on other forms of alcoholic beverages, can be rationalized within the theory of corrective taxation as a means of getting consumers to take the various external costs of their

acts of consumption into account. And as noted above (p. 3) and as shall be discussed in detail in the next section of this essay, it has commonly been suggested that the consumption of tobacco products entails an external cost on the order of $75 billion annually--a figure that is roughly ten times the present tax burden placed on the consumption of tobacco products.

The central idea of corrective taxation is to impose a tax equal to the external cost that is associated with the consumption of a particular product. If this is not done, there is actually an excess burden from the failure to do so; the argument on this point is symmetrical with the discussion of the excess burden of an excise tax that was presented above and illustrated by Figure 1. For instance, suppose the price of a bottle of whiskey is $5 and that the external cost is also $5 per bottle. Each bottle of whiskey consumed is worth $5 to consumers, but the value of the other otuput that is sacrificed to produce that bottle of whiskey is worth $10. Of this sacrificed output, only $5 worth is borne by consumers of whiskey. The other $5 worth is borne by third parties. A reduction in the consumption of whiskey will involve a sacrifice of $5 in consumer value, but will also involve a gain in other valued output of $10.

This line of argument is illustrated further by Figure 2, which shows the symmetry with the excess burden argument developed around Figure 1. In the absence of tax,

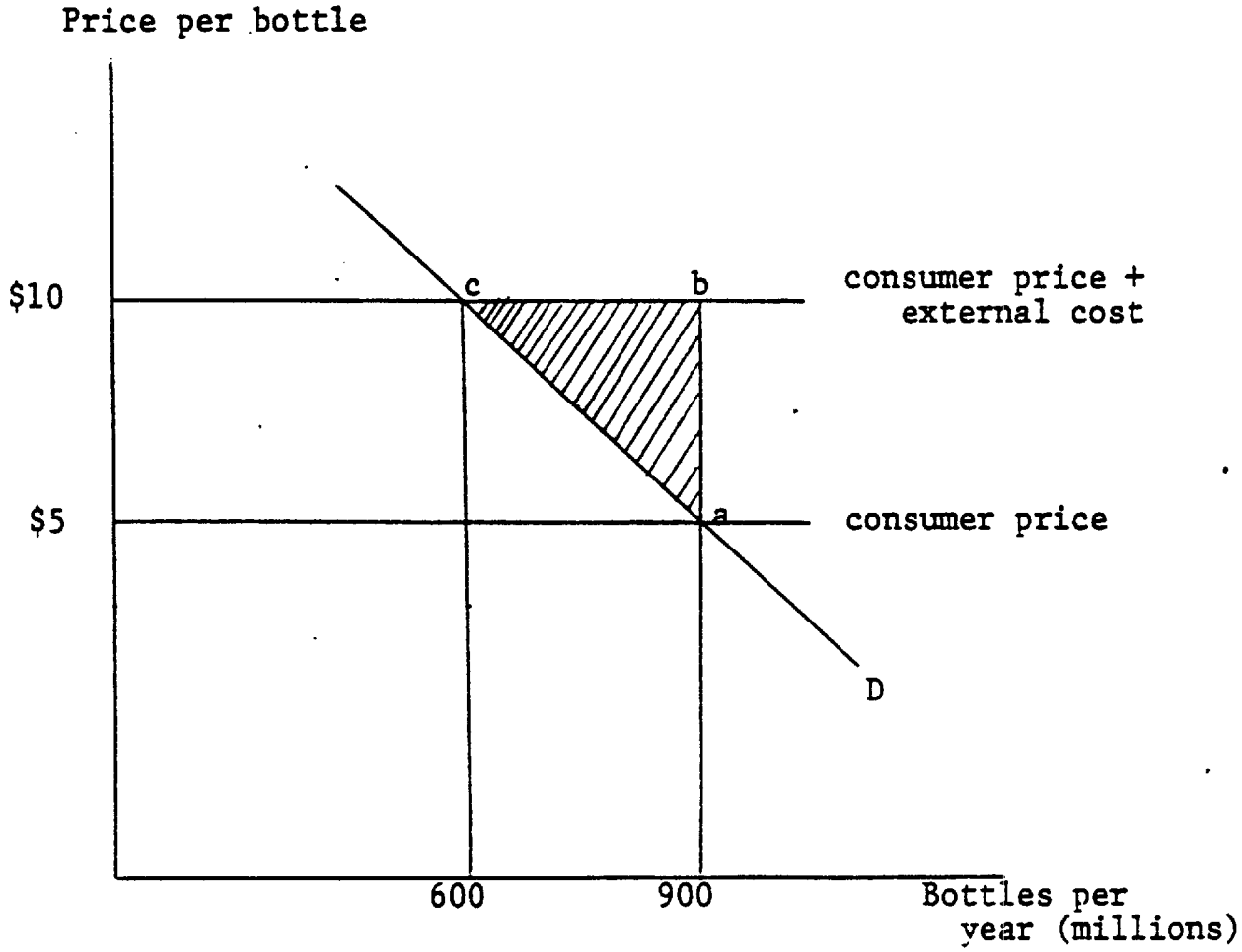

Figure 2--Illustration of the Gain from a Corrective Tax

consumers would buy 900 million bottles of whiskey per year at a price of $5 each. The sacrifice of other output entailed with that much consumption of whiskey is $10, $5 of which is paid by consumers and represents the cost of such inputs as corn and glass, and $5 of which is borne by third parties through damages to person and property. By reducing the consumption of whiskey, alternative output valued at $10 could be secured by sacrificing something worth only $5. And it will be possible to secure such a gain until consumption is reduced such that its value to consumers equals its full cost. This happens, in the illustration at hand, at an output rate of 600 million bottles per year. In this case, consumers pay $6 billion ($10 x 600 million) per year for whiskey, of which $3 billion ($5 x 600 million) is collected as tax and $3 billion ($5 x 600 million) is received by producers. The gain that results from the removal of excess burden, and which is made possible by the corrective tax, is approximately $750 million, as can be computed by the formula

$$\text{Gain} = \tfrac{1}{2}(\$5)(300 \text{ million}) = \$750 \text{ million}.$$

Some Complexities in the Theory of Corrective Taxation. To argue that if producers are able to ignore some costs of their production, a properly chosen tax will lead them to make the same choices regarding production that they would make if they took those costs directly into account is, of course, a truism. However,

it does not follow that the actual imposition of an excise tax for what might seem to be corrective purposes actually performs in the required manner. The theory of corrective taxation is generally much simpler than the reality such efforts at taxation address. There is the obvious question of how a correct, or even a reasonably informed, judgment of external cost might be formed. A market system produces such knowledge as a by-product of its internal workings. If a firm fails to cover its cost of production, this means that the value that consumers place on the firm's output is less than the value they place on the alternative output that was sacrificed to produce the product in question. And the converse conclusion can be reached in the case of a firm that makes a profit.

When a direct market test is absent, as is necessarily the case with external costs, for the very concept implies that some aspects of resource usage are not reflected in market transactions, the problem of securing knowledge is much more difficult. Moreover, a market system provides a strong incentive for people to make choices knowledgeably, because poor choices will result in losses. A growing body of contemporary literature on political economy has explained why political incentives generally operate less strongly than market incentives. In politics, the costs and gains of good and bad choices are concentrated less strongly

on those who make the choices, because more of those costs and gains are diffused generally throughout the citizenry. The loss from a governmental choice that is more costly than it need be is spread over all taxpayers, rather than being concentrated on those responsible for making that choice.

Beyond this problem of knowledge, but yet related to it, a variety of complex issues arise about the particular form a corrective excise tax should take. For instance, suppose it were concluded that the external cost of whiskey consumption were $3 billion annually, in which case it could be argued that a tax of $5 per bottle is the right amount. But it is really not so simple as this. Different acts of consumption by different consumers entail different external costs. Each bottle of whiskey that is consumed does not entail an equal external cost, even if the average external cost is $5 per bottle. Some people may consume a bottle evenly over a month, and always at home in the evening before retiring. Others may consume a bottle entirely in one evening at a party, after which they drive home. The latter but not the former type of consumption has an external cost associated with it.

The difficulty here is that the external cost resides in the method or character of consumption and not in the fact of consumption per se. A general tax on whiskey will impose excess burdens on those consumers

who use alcohol moderately, while failing to place a sufficient burden on those who use it immoderately or dangerously. And it cannot even be claimed that the tax at least represents a movement in the right direction. It might be one, but it need not be so. The reduction in use by dangerous users that the tax promotes does provide a gain through a reduction in external cost. But the reduction in use by moderate users also provides a loss through imposing an excess burden on such users. It is an empirical and open question whether the gain from curtailing immoderate use is greater than or less than the loss from curtailing moderate use.

In any event, the difficulty is analogous to that old saw about using a meat cleaver instead of a scalpel. It is not products themselves that cause external costs for others, but the way in which some products are used. The difficult problem in the theory of corrective taxation is to design such taxes in a way that they influence particular patterns of usage rather than indiscriminately altering the consumption of a product. This might be impossible to accomplish in the particular case of whiskey because it is practically hopeless to try to tax careless but not careful consumption. Since driving is associated with careless consumption, it might be thought that the taxation of liquor sold in bars and restaurants might reasonably conform to such a distinction. However, many moderate and careful

consumers drink in bars and restaurants, and many immoderate and dangerous consumers drink at parties in people's homes. In the case of the external cost of whiskey consumption, or of alcohol consumption generally, remedy is probably better advised to focus on modification in legal and financial liability than to focus on corrective taxation.

In other cases it might be possible to design an excise tax that will modify certain attributes of consumption. Such a tax, however, will not be imposed on the product consumed per se, but on certain attributes of the product or its manner of use that create the external costs. For instance, and to change the illustration a little, consider the problem of litter associated with the consumption of soft drinks (as well as from alcoholic beverages). Similar to the discussion above, and which was illustrated with reference to Figure 2, an excise tax on soft drinks could be imposed and set equal to the estimated litter damage. The tax would raise the price of soft drinks and reduce total consumption, thereby reducing the amount of litter in proportion to the reduction in consumption. But this meat cleaver approach penalizes all consumers even though only some of them litter. Moreover, it reduces litter only in proportion to the overall reduction in the consumption of soft drinks. But what causes the external cost in this case is not consumption per se, but a

particular manner of consumption, namely, consuming and leaving the container behind. The scalpel approach to corrective taxation would seek to modify the attributes of consumption. One way of doing this is to impose a refundable tax on beverage containers, which is roughly equivalent to requiring returnable containers to be used. This type of corrective tax would create a specific incentive not to litter, whereas an excise tax on the product would only create a general incentive to reduce consumption, and with any reduction in litter resulting only as a by-product of the reduction in consumption.

Such an approach to corrective taxation as would be represented by a refundable tax on containers does, of course, discriminate against people who are careful not to litter. At the minimum, such people would now have to bear the inconvenience of having to return bottles. In principle, it is always better to impose costs directly on those who cause them: on those who would damage others through their dangerous consumption of whiskey or through their littering of the landscape. In some cases, however, it may be exceedingly difficult to accomplish this placement of cost directly. There is probably greater scope for doing this with respect to drunken driving than has been attempted to date, but is is certainly exceedingly difficult to see how this could work for litter. Prohibiting or restricting the use of nonrefundable containers or imposing a refundable tax on

containers may be a reasonably practical solution in such a case, even though there is some discrimination against those people who do not ordinarily litter. Particular cases need to be studied in detail to judge whether an excise tax in some form or other, and in what particular form, is the best way of dealing with the external or uncompensated costs that are associated with particular activities. The principle of corrective taxation does not imply anything about particular practices of excise taxation. The tax may be rationalized on corrective grounds, but the reality of the situation might dispute that rationalization, possibly because the tax takes a meat cleaver to consumption of the product, or possibly because the alleged external costs are nonexistent, or at most insignificant.

V. Corrective Taxation as Applied to Tobacco

It is often asserted that the consumption of tobacco products, particularly cigarettes, entails a variety of external costs. As one specific example among a large number of studies, Bryan Luce and Stuart Schweitzer (cited in the appended bibliography) placed these costs, for the United States for 1976, at about $50 billion. And if those costs increased at the average rate of inflation since then, they would now total about $75 billion. If these figures are correct, the present excise taxes on tobacco amount to only about 10 percent of the external cost of tobacco usage, and so the

principle of corrective taxation would require about a ten-fold increase in that tax burden. In these studies of external cost, it is common to distinguish among three main categories of cost. One is the loss of output that is attributed to smoking-related illnesses. This loss was estimated to have been $19.1 billion in the United States in 1976, and would be about $30 billion now after allowing for an average rate of inflation. The second category is the loss of output that results because people die prematurely (defined as death before age 65) because of illnesses that are attributed to smoking. This loss was estimated to be $12.3 billion in 1976, and so would be about $18 billion now. The third category is the cost of medical treatment, mainly the expenses of hospitalization and the services of physicians, This was estimated to be $13.4 billion in 1976, and would be about $20 billion now.

Two types of issues arise regarding the application of ideas of external cost and corrective taxation to the consumption of tobacco products. One is essentially medical or epidemiological, and concerns the accuracy of the various estimates of illness and premature death that are commonly attributed to smoking. The other is economic, and concerns the circumstances under which those costs, given that the illnesses have been properly attributed to smoking, might properly be said to be external or uncompensated. My competence lies in economics and not in medicine or epidemiology, and so I

shall focus on this second issue. In doing so, I shall accept, for purposes of discussion, the presumption that there is a causal relation between increased smoking and decreased health. From this point of departure, I shall examine the economic basis for the claims that the illness, premature death, and medical expenses that are thus attributed to smoking can be said to represent an external or uncompensated cost, and, hence, a drain on the economic well-being of the general members of society--as against being a drain on the individual smokers. Before doing this, however, it may be useful to consider briefly the charge of causation between smoking and health, for the harmful effect of smoking on health does not seem to be nearly so obvious as many people apparently believe it is.

Smoking and Health, Contrary Arguments. The arguments that smoking causes various illnesses and early death is based on certain statistical correlations of the sort that show, for example, a greater frequency of lung cancer among smokers than among non-smokers of a given age. However, such correlations do not by themselves demonstrate causation, as a number of scholars have noted. After surveying much of the literature on smoking and health, P. R. J. Burch concluded his article in the Journal of the Royal Statistical Society by observing:

> As we are all well aware, many eminent persons, committees and commissions have unanimously concluded that lung cancer "is almost entirely due to cigarette smoking". I once shared that view, but having now studied the evidence in more detail and from new angles I feel unable to reach a definitive conclusion, apart from rejecting the "pure" causal theory. Accordingly I find myself forced back to Fisher's (1959) earlier verdict: "the data so far do not warrant the conclusions based on them". To make valid deductions about the causes of disease the rules of statistical inference need to be strictly observed; I hope that interested statisticians will scrutinize the frequent and often strident claims that a given habit or dietary factor causes a particular disease. (At p. 456 of his article, cited in the appended bibliography.)

Indeed, a variety of correlations have been reported that would actually seem to argue for the health-enhancing effects of smoking, if one is consistently to use correlation to infer causation. For instance, smokers have a lower incidence of Parkinson's disease than do nonsmokers. Simple use of correlation would have to attribute a reduced risk of Parkinson's disease as a benefit of smoking. Moreover, a study of smoking and cardiovascular disease among Swiss women showed a sharp increase in smoking and a decline in disease over the 1951-76 period. Again, following typical statements based on correlation, it would have to be concluded that cigarette smoking appears to offer some type of protection against cardiovascular disease.

Correlations, of course, prove nothing one way or the other. At base, the difficulty is that there is yet no generally accepted theory that allows reliable models to be constructed of the process by which smoking

may or may not bring about lung cancer and other diseases. Yet in the absence of some such theory, correlations can have no meaning. At the very least, a positive correlation between smoking and lung cancer provides no way of choosing between these two hypotheses: (1) smoking causes lung cancer, and (2) there are certain genetic factors that simultaneously predispose toward lung cancer and make smoking a particularly pleasant activity. And a large number of other hypotheses could also be developed, all of which would be consistent with a positive correlation between smoking and illness. But without some acceptable model of physiological processes, there is no basis for distinguishing among a variety of explanations that could be given for the observed correlations. Indeed, the U. S. Public Health Service stated as much in its 1977 volume, Research on Smoking Behavior:

> . . . although epidemiological data has clearly established the existence of a correlation between smoking and cancer, a clear-cut causal relationship between cigarette smoking and cancer has not been demonstrated.

What Economic Losses, and to Whom? The commonly attributed pattern of causation may eventually be shown to be correct. It may also be shown to be seriously deficient, if not absolutely wrong. At present the observations, associations, or correlations are not causal explanations. Should research eventually establish that the attributions of causation so prominent today

are inappropriate, all of the statements that have been advanced about the external costs of smoking would, of course, become meaningless. But what if causation is eventually shown to exist roughly in the form in which it is presently postulated? What would be the dimensions of external cost that might thus be addressed through corrective taxation? To explore this question, I shall accept for purposes of discussion the common presumptions about causation, although I do not think the evidence on this point is nearly so obvious as many people claim it is.

The central idea behind the development of estimates of the external cost of smoking is quite simple. Take the cost attributed to lost production due to smoking-related illnesses. The first step is to estimate the amount of work that people miss because of what are considered to be smoking-related illnesses. The second step is to calculate the economic value of this missed work. For instance, if 200 million days of absenteeism are attributed to smoking-related illnesses and if an average daily wage is $100, the lost-production cost of smoking-related illnesses will be placed at $20 billion.

Premature death is treated in these computations as equivalent to a permanent disability. Someone who dies at age 50 is treated as equivalent to someone who becomes permanently incapacitated at age 50. The total loss of earnings until that person would have reached age 65

is treated as the lost-production cost of the premature death. For someone who earns $20,000 per year, the total income lost until age 65 would be $300,000, assuming future income to be the same as present income. Alternatively, some increase in future earnings could easily be allowed for, by increasing each subsequent year's income by, say, five percent.

The main complication that arises for premature death that does not exist for illness is that any amount of money is less valuable in the future than it is now. To get $100 now is more valuable than to get it in one year, because interest can be earned on what is possessed now. With a 10 percent rate of interest, $100 now will be equivalent to $110 in one year; alternatively, $100 in one year is equivalent to $90.91 now, because $90.91 can be turned into $100 in one year. The present value of $100 to be received in one year at 10 percent is, then, $90.91. The loss of earnings in future years that results from premature death is thus discounted to form a present value equivalent, and this equivalent can be computed by the formula

$$PV = A_i/(1+r)^i,$$

where A_i is the amount of income projected to have otherwise been earned during year i after death, and r is the rate of interest.

Medical expenses are treated in essentially the same manner. An estimate is made of the share of medical

expenses that can be attributed to smoking-related illnesses, and a figure for cost is thus calculated. Suppose 100 people are hospitalized with lung cancer, and that the estimated cost of treating a patient is $300 per day. The hospital costs of treating lung cancer would be $30,000 per day. What share of this cost is attributable to smoking depends upon the relative importance of smokers among the total number of people being treated. If it is estimated that 90 percent of the lung cancer patients are smokers, $27,000 per day of the cost of treating lung cancer would be attributed to smoking. A similar procedure is used to estimate the cost of physician's services attributable to smoking. Suppose a physician had 5,000 consultations with patients in one year, the total expense of which was $200,000. If it were estimated that 25 percent of the physician's efforts were devoted to treating smoking-related illnesses, and, moreover, if those treatments were estimated to make an average claim on the physician's time and other resources, $50,000 would be imputed as this aspect of the cost of smoking.

This simple approach underlies all of the efforts to construct estimates of the external cost or waste of smoking. The implication of these estimates is that smoking involves a waste that impoverished Americans generally to the tune of about $50 billion in 1976,

and which could reasonably be placed in the vicinity of $75 billion now. Such notions of external cost or waste would seem to imply, in turn, that if people did not smoke, there would be a general increase in economic well-being of $75 billion. If so, smoking presently imposes an uncompensated cost of about $350 per person, and so the elimination of those costs would provide a gain of about $1,400 for a family of four.

Reconsideration of External Cost. It does not automatically follow that the costs just described represent losses to the members of society generally. They might represent losses only to those particular people who engage in those health-eroding activities. If so, there would clearly be a personal cost associated with smoking, but there would be no external cost and, hence, no case for corrective taxation. If smoking were prevented and the $75 billion cost were to vanish, to whom would this amount accrue? Would it accrue to the members of society generally, giving an average gain of $350 to each person in society? Or would the saving be concentrated on the 50 million or so smokers, who would each gain about $1,400? In the former case a problem of external or uncompensated cost exists, in which case an excise tax might serve corrective purposes. But in the latter case, only personal costs are involved, and there is no case

grounded in principle for the use of an excise tax on tobacco products.

It is often argued that people are ignorant about the health risks of smoking, which makes it erroneous to argue that the very fact of smokers' choices to smoke means that they value smoking more highly than they value whatever it is they could otherwise buy with the $1,400 costs they incur through reduced earnings and higher medical expenses. As noted above, there is indeed substantial scientific ignorance about underlying patterns of causation, which makes it impossible to determine what the risks truly are. Yet there is hardly anyone who is unaware of the claims about risk to health from smoking. There is surely much more awareness about the claims of the Surgeon General than there is about the complex arguments about causation on the other side. If anything, people's perceptions of a risk from smoking would seem to be more strongly held than would be warranted by the scientific knowledge to date. Ignorance about claims of health hazards, accordingly, can hardly be adduced as a reason for the continuation of smoking among Americans. The derivation of benefits from smoking in excess of the cost of smoking--including both the price of cigarettes and the perception of risk--seems the more adequate explanation for smoking. It is still possible, however, that people do not bear the full costs of their

choices, and if they did bear those full costs they would smoke less.

Consider first the case of lost production due to illness. Suppose non-smokers miss an average of 8 days of work per year while smokers miss 12 days. In what sense might smokers be said to impose a cost on non-smokers? If all people are paid the same amount per year regardless of how much they are absent, it can be said that non-smokers are working four days for the benefit of smokers. Should smokers stop smoking and thus become absent only 8 days per year, total production will rise, and this rise in production will be shared between smokers and non-smokers.

What makes this gain in production shared generally throughout the population is the assumption that people are paid the same regardless of how much they work. But this form or approach to compensation is not at all descriptive of the way our economy works. In many cases people are paid directly for the work they do, as when they are paid by the day, by the piece, or through commission. In these cases, the cost of lost production is borne by the people who miss work, and in proportion to the amount of work they miss. There are also important indirect ways in which people are paid according to the work they do. Even though some people are absent 8 days a year and others 12 days, and both receive the same pay because of provisions for sick pay,

the smokers will still be the cost of their greater absenteeism. In this case they will bear it through a reduction in their rate of promotion or advancement, as people who, other relevant factors like ability the same, are absent less often will advance more rapidly into higher paying positions. Smokers will bear the cost of their absenteeism in this case through a reduction in their earnings relative to what they would have been had they been absent less often and, thereby, had advanced faster and farther. Stated conversely, should smokers stop smoking and become as healthy as non-smokers, production will increase, but the beneficiaries of this increase will be the former smokers. The reduction in absenteeism clearly increases output, but this increase accrues essentially to those who subsequently become absent less often.

Since premature death is treated conceptually as a lengthy illness in the various claims about the external cost of smoking, any premature death that is attributed to smoking will entail no external cost. Any loss of output that results is concentrated on the decedent. A reduction in the rate of premature death will not increase the incomes of non-smokers; the gain in income will be concentrated on the smokers who would otherwise have died earlier. Drunk drivers harm others when they crash into third parties. People who litter harm others when they despoil the landscape.

But smokers harm only themselves, at least with respect to the production that is lost because of their more frequent and longer illnesses and by their earlier deaths.

But what about the additional medical expenses that are attributed to the treatment of smoking-related illnesses? If people should pay their own medical expenses directly, this case would be the same as those involving lost production and premature death, so no issue of external cost would arise. The resources that people would use in receiving medical care would be resources that they themselves had purchased in their capacities as consumers. The $20 billion or so of medical expenses that are attributed to smoking-related illnesses, and which would be saved by a cessation of smoking, would represent savings all right, but they would accrue to the smokers who no longer required such medical care and not to the members of society generally. Smokers would thus bear the cost of their own higher medical expenses.

It is essentially no different when medical expenses are paid through the various insurance arrangements that typically cover a portion of a person's medical expenses. Looked at after the fact, people who are sick more often would seem to be subsidized by those who are not. But this is true of all insurance programs when viewed after the fact. People who have

automobile accidents seem to be subsidized by those who do not. People whose homes are damaged or destroved by fire seem to be subsidized by those whose homes are not. People who require medical care seem to be subsidized by people who do not. All insurance has this property after the fact: some people appear to be subsidized by others. But the appropriate perspective toward insurance is before the fact and not after. When looked at from this proper perspective, all participants must look upon their participation as beneficial, for otherwise they would not have chosen to participate in the first place. People choose to participate in an insurance program because they judge the benefits of coverage in the event of accident or illness to be worth the price of participation, even though the most likely outcome is that their total premioum payments will exceed their total claims.

But what about governmentally provided subsidies for medical care? An article in the 11 May 1982 issue of the Wall Street Journal perhaps reflected a generally held notion when it remarked: "Uncle Sam has a budgetary interest in the cigarette toll [on health] because Medicaid and Medicare pick up a significant part of the medical bills for afflicted smokers." This type of sentiment raises both factual and analytical questions.

Factually, there is no basis for claiming that smokers place an above-average claim on medical resources.

Indeed, they may well place below-average claims on such resources. This may be true even if it is assumed that smoking reduces health; indeed, it may be the very ability of smoking to reduce health that makes this outcome possible. It is simply not correct to compare two sets of people at the same age, to note that the smokers have higher medical bills than the non-smokers, and then to conclude that smokers use an above-average amount of medical resources. If it were correct, this claim would clearly imply that a reduction in smoking would reduce medical bills and, thereby, taxes. Among people at any particular age, smokers will incur an above-average amount of medical expenses. But one facet of the poorer health of smokers (perhaps it should be reiterated here that I am assuming this only for purposes of discussion) is that they have shorter life spans. With shorter life spans, smokers make less use of extended stays in hospitals and convalescent homes in the later years of life, and where many of the expenses are covered by Medicare and Medicaid. A smoker who dies prematurely is not around to make those costly claims that occur later in life. The correct question regarding subsidization under Medicare and Medicaid is not the one typically asked and which involves a comparison between smokers and non-smokers at the same age, but is whether smokers or non-smokers have higher medical expenses over their respective lifetimes.

To my knowledge no such data exists at this time on this question; at present there is no factual basis for making any statements about who subsidizes whom.

But what about the analytical questions? Suppose smokers do make greater use over their lifetimes than non-smokers of medical resources subsidized by government. If this is so, a reduction in the amount of smoking will reduce total expenditures on medical care in the government's budget. Any such saving should redound to the general benefit of the citizenry through lower taxes, and not just to the specific benefit of smokers through lower personal payments for medical care.

But is there an issue of external cost here? Or is the issue a very different one of who subsidizes whom? To examine the distinction between these two types of issues, it will be helpful first to reconsider the earlier illustration of external cost and the gain from corrective taxation. Recall that this illustration dealt with drinking and driving, and was illustrated by Figure 2. In that context, two settings or policies were compared. In one case, drinkers who were involved in automobile accidents did not bear the cost of the damage they inflicted on others. In the other case, they bore the full cost of those damages through a corrective excise tax. With reference to the data illustrated in Figure 2, when drinkers bear none of the external cost, they buy 900 million bottles of whiskey

at a price of $5 each. The cost they impose on their victims is $4.5 billion ($5 x 900 million). This $4.5 billion can be thought of as a transfer to drinkers that results from a policy that frees them from liability for the damage they inflict on others.

But what is at stake in making drinkers bear the external costs? Who gains what, and how? Suppose drinkers were to bear this cost, only they were to continue to drink as much and to have as many accidents. (This would mean that the demand for whiskey was completely inelastic, and would be represented by a vertical demand curve.) Drinkers would now be $4.5 billion poorer through the taxes they now had to pay, and victims would be $4.5 billion richer, assuming the revenues were used to compensate victims. This transfer of income would benefit one set of people (victims) to the detriment of another set (drinkers). It might be argued that this transfer was justifiable on moral grounds. But this approach to justification is a different matter from the point about external cost and corrective taxation. The presence of external costs implies a general reduction of wealth within society; the presence of transfers does not. In the case at hand, there is no effect upon the amount of damage inflicted through drinking-related accidents; regardless of the direction of transfer, the same damage is done to person and property.

The social or general gain, as distinguished from the transfer, comes about precisely because the increase in cost to drinkers reduces the amount of drinking and, hence, and more importantly, the amount of damage. The corrective tax reduces the amount of accident damage by $1.5 billion ($5 x 300 million). Besides this reduction in damage, the tax also transfers income from drinkers to victims. The amount of transfer is $3 billion ($5 x 600 million). This transfer is a by-product of the program that imposes a tax on drinking to compensate victims for damages suffered. Both effects are present in the same program in this particular illustration. There is a transfer from drinkers to victims of $3 billion per year; here, the gains to one set of people equals the losses to the other set. There is also a shift in the pattern of resource usage in society, with resources being shifted away from the production of whiskey, automobiles, and hospital facilities into other activities that consumers value more highly.

What a system of subsidized medical care basically amounts to is a transfer of income from people who make below-average claims on medical resources to those who make above-average claims. With respect to smoking, an external cost would arise from such a transfer program only to the extent that the subsidization of medical care would induce people to smoke more, and with the

increased smoking leading to increased illness and higher medical expenses. The mere fact of subsidy does not represent an external cost, the removal of which will provide a general gain for the members of society. The mere fact of subsidy means only that its removal will provide a gain for those who were making a below-average use of medical resources, and this gain will come at the expense of those who were making an above-average use. It is highly unlikely that the presence of subsidized medical care induces people to smoke more, and thereby to become more sickly. Removal of subsidized medical care would surely have little if any effect on the amount of smoking and, hence, on the amount of smoking-induced illness.

Removing the subsidization of medical care will, of course, reduce the claims people make upon medical resources. Smokers, as well as everyone else, will make more use of medical care when it is subsidized than when it is not. The subsidization of anything increases the amount of it people will choose to buy. This is precisely why medical costs have risen from about five percent of national income before the advent of significant subsidization in the mid-1960s to about ten percent now. But such subsidies are unlikely to increase the amount of smoking and, hence, the amount of smoking-induced illness. Medicare and Medicaid encourage people to make greater use of medical resources, but

they do not encourage people to become more sickly than they would otherwise have been. Smoking has little if any external cost, even if medical expenses are subsidized. The increased use that smokers make of medical resources is identical to the increased use that others make as well, and this is an inevitable outcome of any program of subsidization.

VI. Concluding Remarks

There is no way in which the $75 billion figure bandied about so prominently as an external cost of smoking can be said to constitute a general, social loss. The elimination of smoking will not provide a general bonus of $350 to each person in society. For the most part, any such gain will accrue to smokers, though at the sacrifice of the benefits they receive from smoking. A selective excise tax on tobacco does not seem warranted by a principled application of the theory of corrective excise taxation. Rather, the selective taxation of tobacco seems more likely to represent the imposition of a punative tax on smokers, who are a disfavored and increasingly pilloried minority in present American society. It is this weak position of smokers in conjunction with the taxing-and-spending biases of government, and not some effort to promote matters of common or general value, that seem best able to explain both the present level and what would appear likely to be the future prospects for the taxation of tobacco products.

A BRIEF NOTE ON REFERENCES

In this brief bibliographical note I shall describe a few sources that are pertinent to various of the topics I discussed in the essay.

Vast amounts of information about taxation at all levels of government are provided in the biannual publication, Facts and Figures on Government Finance, which is published by the Tax Foundation, Inc. of Washington, D.C. Richard E. Wagner, Public Finance: Revenues and Expenditures in a Democratic Society (Boston: Little, Brown, 1983), is a textbook for advanced undergraduates that explores the economic and political aspects of taxing and spending.

For one study of the ability of excise taxation to modify the particular characteristics of products, see Charles J. Goetz and Italo Magnani, "Automobile Taxation Based on Mechanical Characteristics: Evidence from the Italian Case," Public Finance, 24 (1969), 480-94. For an explanation of why the cost of producing one product is equivalent to the value that consumers place on the output that is thus sacrificed by those resources that could otherwise have produced that alternative product, see James M. Buchanan, Cost and Choice (Chicago: Markham, 1969).

The reference to Luce and Schweitzer noted in the text is Bryan R. Luce and Stuart O. Schweitzer, "Smoking

and Alcohol Abuse: A Comparison of their Economic Consequences," New England Journal of Medicine, March 9, 1978, 569-71. Greater detail is presented in Luce and Schweitzer's The Economic Costs of Smoking-Induced Illness, National Institute on Drug Abuse Research Monograph Series, No. 7, published by the then Department of Health, Education, and Welfare, in 1977. The reference to Burch's study cited in the text is P. R. J. Burch, "Smoking and Lung Cancer: The Problem of Inferring Cause," Journal of the Royal Statistical Society, Series A, 141 (1978), 437-58. Immediately following this study is a set of commentaries, some supportive and smoe not, and running from page 458 to page 477. On the study for Swiss women, smoking, and cardiovascular disease, see E. Guberan, "Surprising Decline of Cardio-vascular Mortality in Switzerland, 1951-76," Journal of Epidemiology and Community Health 33 (1979), 114-20.

For an application of the same framework commonly used for smoking to the consumption of alcoholic beverages, see Ralph E. Berry, Jr. and James P. Boland, The Economic Cost of Alcohol Abuse (New York: The Free Press, 1977).