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Value-Added Tax and Excises: Commentary

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Commentary: Sin Taxes

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Public policy makers have long been fascinated with the notion of taxing sinful consumption. The notion that the government could encourage proper behavior, and, in the process, raise revenues to spend on other beneficial causes, is a powerful one. And developed nations have a long history of specific excise taxes on sin goods like tobacco and alcohol. In the United States, in 1960, 12.8% of government revenues were raised by specific excise taxes. By 2005, however, this had fallen to 3.2% (Gruber, 2007).

While sin taxes may make good politics, however, economists have often claimed that they make bad policy. The traditional economics argument towards sin taxes is straightforward. If sinful consumption levels are chosen by rational and fully informed agents, and those activities cause no harm to others, then the government has no more right to tax these activities than any other activities that are non-externality producing. By revealed preference arguments individuals are pursuing the optimal level of such activities and there is no need for "correction" through taxation. The only particular role for excise taxation is to correct the externalities that sinful consumption may cause, in addition to their usual role in the optimal system of commodity taxation.

Section IV of the Chapter by Crawford, Keen and Smith provides a very careful discussion of the role of excise taxation on smoking, drinking and motor fuels. The authors make four important points. First, they integrate these specific commodity taxes into the larger optimal commodity taxation argument developed earlier in the chapter. They conclude, I think rightly, that the evidence is sufficiently unclear to motivate specific excise taxes on these particular goods (relative to the standard VAT rate) solely from elasticity-type arguments. I will leave this issue for other discussants.

Second, they raise the well-known equity concerns around such taxes. Since lower income groups spend a much larger share of their income on "sinful" consumption such as smoking or drinking, then these taxes are typically viewed more regressive than the general VAT, which would offset any efficiency argument for higher taxes. Third, they review estimates of externalities due to alcohol and tobacco consumption and their implications for optimal taxation, highlighting the difficulties of translating externalities to tax policy when damage is highly non-linear (as is the case with alcohol). Finally, they discuss the some issues in the appropriate structure of excise taxation, particularly the equality of taxation across types of alcohol.

In this review essay, I will take issue with the baseline model that underlies the analysis of the Chapter. Based on existing evidence and on recent developments in behavioral economics, the standard economics model of "sinful" consumption appears woefully inadequate. When sensible alternatives are applied, traditional conclusions such as those drawn here can be turned on their heads. My discussion will focus on the cases of smoking and alcohol, as discussed in the chapter; I will also include a discussion of perhaps the most important externality of all in the U.S. context, obesity. I will leave aside the issue of proper taxation of motor fuel, which is discussed extensively in recent work by Don Fullerton and co-authors (e.g. Fullerton and Gan, 2005).

Part I: The Standard Model of Sinful Consumption and Implications for Government Policy

In the standard economics model, there is nothing special about consumption of sinful goods as opposed to standard goods. Individuals optimize a well-defined utility function over a bundle of goods, some of which are sinful and some of which are not. If there are no external effects on others from the sinful consumption, then there is no call for government intervention.

For years, an informal claim was that the addictive nature of some sinful consumption (e.g. cigarette smoking) would justify government intervention even if there were no externalities. This claim was rejected in a pathbreaking article by Becker and Murphy (1988). In the Becker and Murphy model, individuals recognize the addictive nature of choices that they make, but may still make them because the gains from the activity exceed any costs through future addiction. In this "rational addiction" framework, individuals recognize the full price of addictive consumption goods: both the current monetary price, and the cost in terms of future addiction.

Becker and Murphy model the act of addictive consumption (such as smoking) as the building of an addiction stock. The more cigarettes smoked today, the greater the addiction capital tomorrow. High addiction capital lowers *average* utility but raises the *marginal* utility of smoking. In this way, smoking lowers future utility but also increases the craving for another cigarette. The key feature of any addiction model is on how people deal with this intertemporal problem. In the original Becker-Murphy formulation individuals discounted the future *exponentially*, meaning that they discount k-periods forward by δ^k, where δ is the per-period time discount factor. This assumption has turned out to be central, as will be discussed further below.

Rational addiction subsequently became the standard approach to modeling consumption of goods such as cigarettes. The key normative implication of this approach is that the optimal regulatory role for government related to smoking is solely a function of the interpersonal externalities induced by smoking. Since smoking, like all other consumption decisions, is governed by rational choice, the fact that smokers impose enormous costs on themselves is irrelevant; it is only the costs they impose on others that gives rise to a mandate for government action.

The conclusions of this traditional economics literature create a central policy importance for the measurement of exerternalities associated with sinful activities. Over the past 20 years, a sizeable literature has been devoted to the measurement of these externalities. The Chapter provides a nice review of externality estimates. While there are a number of interesting details, the bottom line is that the estimated externalities from smoking are quite small, while those from drinking are large. This is because most of the damage done by smoking is *internal* (through shorter lives), not external. Indeed, the limited external damage done by smoking (through higher system wide health costs) is largely offset by the savings through reduced pension payments due to earlier death of smokers (the so called "death benefit"). On the other hand, most of the damage from drinking is *external*, in the form primarily of drunk driving and induced criminal activity (the latter being a platform where it is much harder to measure the causal impacts of alcohol per se).

It is important to recognize some controversy in these estimates, however. The most important source of controversy is the relevance of external costs imposed on family members, such as through secondhand smoke or alcohol abuse. If smokers are maximizing a family utility function, rather than simply considering individual utility, then these costs should not be considered externalities. That is, if maximizing family utility, the smoker or drinker will take into account any damage done to others in the family in trading off the costs and benefits of smoking. Available evidence, however, suggests that family utility maximization is far from complete. For example, Lundberg, Pollack, and Wales (1997) show that, in contrast to the family utility maximization model (where everyone cares equally about all the family members), shifting the control of household financial resources from husbands to wives significantly increases the expenditures made on behalf of children.

Part II: Problems With the Standard Model

A major problem with the perspective just outlined is that it is not consistent with observed excise tax policy in developed nations. Taxes on tobacco are typically many multiples of the externality estimates, particularly in European countries, while taxes on alcohol are much lower than the externality estimates. One explanation for this inconsistency is a lack of faith in the standard model among policy makers – and, implicitly, among the public as well.

The Irrationality of Youth

This lack of faith may reflect two realities about sinful behaviors that are not reflected in the standard model. This first is that engagement in such behaviors often begins at a young age. Of all U.S. adults who smoke, more than 75% begin smoking before their nineteenth birthday (Gruber and Zinman, 2001). One-quarter of the estimated number of illegal drug addicts in the U.S. are under the age of 17 (Pacula et al, 2001). Despite the illegality of sales to, and consumption of, alcohol by minors in the U.S., 88% of 15 year olds report having had a drink, one-quarter report drinking at least weekly, and one third report having been drunk twice or more in their life. On this last count, in fact, the United States appears to have much less child usage than other nations; the United States ranks tenth in developed nations, for example, in the share of 15 year olds who have been drunk twice or more in their life (Cook and Moore, 2001).

While models such as Becker and Murphy's presume a "homo economicus" who is making rational and forward-looking decisions, most would admit that such a model does not fit the teenagers who are making potentially addictive decisions.

Indeed, there is some evidence that this monumental decision may not be made in the forward-looking fashion required by rational addiction models. A survey asked high school seniors who smoked a pack a day or more whether they would be smoking in five years and then followed the seniors up five years later. Among those who had said they would be smoking in five years, the smoking rate was 72%—but among those who said they would *not* be smoking in five years, the smoking rate was 74%! This result suggests that teens who smoke may not account for the long-run implications of addiction.

So how do young persons make decisions about whether to smoke, drink, overeat, or use drugs? In fact, we know remarkably little about this question. The state of knowledge is reviewed in the papers in Gruber (2001), and is summarized in the introduction to that volume. There are three key lessons from the analyses that underlie that volume. First, the actions taken by children along a variety of such "sinful" behaviors have important implications for their behavior as adults. For example, Gruber and Zinman (2001) document a strong intertemporal correlation between youth smoking and adult smoking; the causal link is established by exploiting variation in the taxation of cigarettes faced by individuals as youths (those who face higher taxes as youths smoke less both as youths *and* as adults). And Cook and Moore (2001) show that individuals who grew up in states and years with higher drinking ages are less likely to engage in binge drinking later in life.

Second, we know that these youth behaviors do respond to economic incentives. Most of the papers in the Gruber (2001) volume show that youth risky behaviors do respond rationally to incentives: youths smoke more, drink less, and use fewer illicit drugs are prices are higher; youths use fewer illicit drugs and drive more safely when the criminal penalties for not doing so are higher; youths stay in school and avoid unprotected sex when the labor market returns to completing education are higher; and so on. Finally, unfortunately, we know that economic incentives and other standard socio-economic controls can only explain a small part of the behaviors of youth over time. There are enormous time trends in smoking, drinking, drug use, crime, and youth fertility that are not readily explained by our economics models.

As a result, it is extremely unlikely that the complicated mechanics underlying the Becker and Murphy (1988) model can do much to explain the decision of youth to pursue addictive behaviors. This may be a well-earned source of skepticism among policy-makers as they seek to apply these conclusions to policy-making.

The Inconsistency of Adults

The other type of evidence, or at least introspection, that may deter policy makers from applying the standard model is the inconsistency in adult decision making over sinful activities. There is an enormous body of evidence that adults are *time inconsistent* in their behavior towards such activities: the problem isn't their rational ability to make plans, the problem is that they lack the self-control to carry out those plans.

The term ``rational addiction" obscures the fact that the Becker and Murphy model imposes two assumptions on consumer behavior. The first is that of forward-looking decision-making, which is a centerpiece of most welfare analysis in economics. Becker and Murphy also assume, however, that individuals *can not only optimize their utility function, but that they can then carry out those optimal plans*. There is much evidence from psychology, however, that contradicts this assumption: individuals are often unable to carry out long-term plans that involve self-control when there are short-term costs to doing so. An excellent example of this is smoking, where there is a short-term cost of quitting (in terms of physical discomfort and perhaps mental distress), but a long-term health benefit. Perhaps as a result, eight in ten U.S. smokers express the desire to quite smoking, but many fewer than that actually do quit. Other examples include retirement savings (short-term cost in terms of forgone consumption today, but long-term benefits in terms of a higher standard of living in retirement), or whether to diet and/or exercise (short-term costs in terms of less food or more work today, but long-term benefits in terms of a longer life). In many arenas, individuals appear unable to control their short-term desires for their own longer-term well-being.

There are three types of evidence for the existence of self-control problems. The first is from laboratory experiments in psychology. In laboratory settings, individuals consistently reveal that they are willing to be patient in the future, but are impatient today, the defining characteristics of self-control problems. A person with self-control problems has the right long-run intentions (he rationally optimizes his utility function given his budget constraint), but he just can't carry them out. For example, in one experiment, most people preferred a check for $100 they could cash today over a check for $200 they could cash two years from now. Yet the same people prefer a $200 check eight years from now to a $100 check six years from now, even though this is the *same choice*—it's just six years in the future (Ainslie and Haslam, 1992). This is indicative of self-control problems: individuals are willing to be patient in the future, but not today when faced with the same choice.

The second type of evidence for self-control problems is the demand for *commitment devices***.** If individuals have self-control problems and are aware of those problems, they will demand some type of device that helps them fight these problems. And the search for such commitment devices is the hallmark of most recommended strategies for quitting smoking: people regularly set up systems to refrain from smoking by betting with others, telling others about the decision, and otherwise making it embarrassing to smoke. These practices help individuals combat their self-control problems by raising the short-run costs of smoking to offset the short-run benefits of smoking. The use of self-control devices is widespread in other arenas as well: individuals set up "Christmas Clubs" at their banks to make sure they have enough money to buy Christmas presents, and they buy memberships at sports clubs to commit themselves to work out when it would generally be cheaper to just pay each time they go

The final type of evidence is patterns of data that are inconsistent with the standard model. For example, Angelletos et al. (2001) calibrate a model of the savings decision which shows that asset holdings patterns in the U.S., with many individuals holding savings in illiquid forms but no savings (and often debt at high interest rates) in liquid forms, is inconsistent with the standard model but arises naturally in a model with self-control problems (since illiquid savings provides a commitment device).

Gruber and Mullainathan (2002) provide a test in the context of cigarette smoking. They note that an important distinction between the Becker-Murphy model and models with time inconsistency is the welfare impacts of taxation. In the Becker-Murphy model, since an exponential individual makes a time-consistent choice to smoke, a rise in taxes can only *lower* discounted utility today. If it were to raise it, then the rational addict could raise utility by simply reducing smoking by the amount that the tax does, i.e. by emulating the tax. So cigarette taxes should reduce the welfare of time consistent rational addicts. Yet Gruber and Mullainathan find that higher cigarette taxes lead to *higher* levels of reported well-being among smokers. This is inconsistent with the standard model but, as explained below, could be due to the welfare gains of government provision of a commitment device in the self-control model.

It is equally important to clarify that there is a host of evidence on addictive behaviors that *does not* distinguish time inconsistency. The fact that consumers, even youths, are price sensitive in their consumption decisions of goods such as cigarettes, alcohol and illegal drugs does not mean that they are time consistent, simply that they are rational (which is true in most alternative models discussed below). Particularly misleading is the sizeable literature growing out of Becker, Grossman and Murphy (1994) that shows that addictive consumption responds to future prices as well as current prices. This finding has been taken to support the Becker-Murphy model *in toto*, but this is not the case. As highlighted by Gruber and Koszegi (2001), this evidence simply serves to prove that individuals are rational and forward-looking, not that they are time consistent.

Part III: Policy Implications of an Alternative Model: The Case of Smoking

There is by now broad agreement among many economists on the failures of the Becker-Murphy model to appropriate capture sinful behaviors such as smoking. Over the past seven years, several alternatives have been developed. While these alternatives differ, sometimes dramatically, in detail, they all have at their core the same concept: problems of self-control in the face of temptation. In this section I discuss in detail one such model, the quasi-hyperbolic discounting model of Gruber and Koszegi (2001, 2004). Since much of the literature is focused on the case of smoking, I will consider that case here as well; below I will expand the discussion to encompass other "sinful" activities.

The Quasi-Hyperbolic Discounting Model and Its Implications

A major alternative approach to Becker and Murphy's (1988) model uses the *quasi-hyperbolic discounting* model developed by Laibson (1997) and O'Donoghue and Rabin (1999). In contrast the exponential discounting used by Becker and Murphy, in this quasi-hyperbolic formulation, next period is discounted by $\beta\delta$, the following period by $\beta\delta^2$, and k periods in the future by $\beta\delta^k$, where $\beta<1$ is an extra discount factor that changes the discounting of this period relative to the entire future. The key feature of such a hyperbolic model is that individuals will have self-control problems. Specifically, a sophisticated hyperbolic individual (one who knows that he discounts hyperbolically) would like to smoke less in the future than he actually can. The problem arises because he is patient about the future (the relative discount rate between future periods is δ), but impatient about the present (the relative discount rate between today and tomorrow is $\beta\delta<\delta$). This means that when the future arrives he will end up making more impatient choices (i.e. smoke more) than he would like to from today's vantage point.

An alternative formulation of time inconsistency is the *I* case, where individuals do not recognize their own self-control problems (O'Donoghue and Rabin, 1999). One feature that distinguishes time-consistent agents from time-inconsistent agents is an inability to realize desired future levels of smoking. As noted above, unrealized intentions to quit at some future date are a common feature of stated smoker preferences.

Gruber and Koszegi (2001, 2004) augment the Becker-Murphy model by applying such quasi-hyperbolic preferences. This simple change has a radical implication: the discounted utility of a sophisticated hyperbolic consumer can rise if a tax is imposed. The reason is that the tax serves as a self-commitment device, which the private sector cannot perfectly supply.[1] As Gruber and Koszegi (2001) highlight, "The argument that people act in their best interests so … the government should leave them alone, is immediately invalidated in our setting. Therefore … a benevolent social planner would want to intervene in this economy".

That self-control problems could overturn the externalities-only motivation for taxation in the standard model is not very surprising. More striking is the implications of this alternative model for levels of optimal taxation. Gruber and Koszegi (2002)

[1] Gruber and Koszegi rule out perfect private sector commitment devices by assumption. As they discuss, any voluntary commitment device can readily be undercut by a voluntary "de-commitment" device, and non-binding contracts for long term commitment cannot be readily enforced. At the same time, they recognize that there are limits on government taxation, such as smuggling. So while they refer to the calibrations discussed below as optimal taxation, they recognize that they really refer to the optimal combination of private commitment and enforceable government policies.

undertake a detailed calibration exercise based on their quasi-hyperbolic formulation to account not only for the externalities but also the *internalities* of smoking – that is, to value the cost to the individual themselves. They do so just for the mortality effects of smoking, ignoring other personal costs such as non-fatal illness and personal discomfort.

For this calibration exercise, they use consensus estimates of the value of a life from Viscusi (1993), and account for the fact that the years lost from smoking are at the end of life and so should be discounted to the present. Their results suggest that the internality from smoking a pack of cigarettes is *over $35 per pack*. This is an enormous figure which is on the order of 100 times as large as the externalities associated with smoking. This large figure is driven by the large damage that smoking does to health and the high implied value of life from Viscusi's work.

Gruber and Koszegi (2002) present a range of estimates for the implied optimal tax based on this internality (which would be in addition to any externality-based effects discussed earlier). The optimal tax level depends on a number of parameters in the model, most importantly the shape of the discount rate (determined by the quasi-hyperbolic parameter β) and the level of the discount rate δ. As individuals are more hyperbolic in their decision making, the optimal tax rises; but as they are less patient, the optimal tax falls, since they care less about the damage done at the end of life. The optimal tax is estimated to be about $1 for individuals who are impatient (10% discount rate) and close to time consistent (β= 0.9), rising to over $9 for individuals who are patient (3% discount rate) and far from time consistent (β= 0.6); the lower level of β is much more consistent with available laboratory and calibration evidence. Thus, this alternative model rationalizes the higher levels of cigarette taxation that we see in developed countries.

This model also has a number of other important implications. First, the optimal level of taxes rises with the stock of addiction; individuals with more past exposure the addictive behavior should face higher taxes, since the internalities to them are largest from continued participation in the activity. This implies, for example, that the optimal pattern of taxation of such goods is to have a high tax initially that declines as habits are broken. This is the opposite of the traditional prescription of rising taxes over time, which are usually supported on distributional grounds; but I question such distributional motivations below.

Second, a key underlying feature of the Becker-Murphy model is intertemporal complementarities in smoking decisions. Thus, raising the tax in one period can lower consumption in all periods. This implies that if there are barriers to raising taxes at some stage in life (e.g. on adults), it would motivate higher taxes at a different stage (e.g. on children). Moreover, if one extends this point to space rather than time, it suggests a novel justification for smoking bans in restaurants or at work. Since we cannot effectively regulate smoking in the home, if smoking is complementary across locations, we may want to regulate it more severely in observable locations. That is, since we are undertaxing in one location, we want to overtax in another, so that clean air regulations are not only protecting non-smokers, but potentially the smoker themselves as well.

Third, these conclusions also hold for naïve time inconsistent consumers, but there is an important distinction. In this case the tax corrects not just a self-control problem but a misperception problem as well. Unlike the sophisticated case, therefore, it is possible in the naïve case that the appropriate policy prescription is a complete ban rather than just corrective taxation. Thus, if we think that young smokers are "irrational" naïve consumers, then a ban on youth smoking with a tax on adults could be the optimal policy prescription.

Finally, contrary to popular perception, taxes on goods such as cigarettes are *not* regressive. Since sinful goods such as cigarettes and alcohol consume a larger share of budgets for lower income households, such taxes are typically viewed as regressive. But the goal of tax incidence analysis is not simply to measure who consumes more of a good, but rather who is "hurt" by taxation of the good. The two are typically viewed as equivalent for incremental taxes by the envelope theorem. But the envelope theorem does not hold for quasi-hyperbolic consumers. In that case, measuring the burden of taxation implies measuring both the burden due to current consumption and the self-control benefits from taxation.

Gruber and Koszegi (2004) develop a "self-control adjustment" to account for this point. This adjustment is rising in the price sensitivity of smoking decisions; the more price sensitive are consumers, the larger is the self-control value of taxation. It is also rising in the degree of time inconsistency, but falling in the discount rate (for reasons discussed above) and falling in the value of life. They undertake a number of calibrations which account most importantly for the fact that lower income groups are much more price sensitive in their smoking decisions than are higher income groups. As a result, for a broad range of parameters, they find that cigarette taxes are *not* very regressive, and may actually be progressive. This contradicts the presumption made towards regressivity in the indirect taxation chapter.

Part IV: Policy Implications for Taxing Alcohol and Obesity

Determining the optimal taxation of cigarettes is hard in one sense, which is the weight to put on internalities. But in other senses it is quite simple, because cigarettes have the nice feature that damage is monotonic and essentially linear: every cigarette is bad for you, and each additional cigarette is worse by a roughly equal amount (at least as far as science can tell today). This is not true for other important sources of "sinful" consumption.

Alcohol

These problems are easily illustrated for alcohol. Much, if not most, alcohol consumption is likely done by those who will exert little external impact on others. Indeed, when Manning et al. (1991) measure the externalities due to alcohol, they focus on "heavy drinkers" who report having more than two drinks per day (and likely have many more given underreporting of consumption); consumption by such drinkers is less than half of total alcohol consumption. It is infeasible, however, to only tax heavy drinkers and not others. This non-linearity in external damage may, in fact, explain the low taxation of alcohol relative to its external damage: the typical drinker is not responsible for such damage and so would view as highly unfair taxation to compensate for it.

As noted in the Chapter, this issue was initially addressed by Diamond (1973), who discusses externality taxation in a context where all individuals causing externalities must be taxed at the same rate, but where the externalities from some are more damaging than those from others. Diamond shows that if the externality function is linear, then the corrective tax should be a weighted average of the marginal externalities, where the weights are the elasticities of demand for the good. If the externality function is non-linear, however, then the corrective tax is related to the total cost of the externality divided by the number of consumers, which can be much *higher* than the weighted average marginal externality.

A behavioral perspective on this question is taken by O'Donoghue and Rabin (2006). They use a model with self-control problems to investigate the importance of population heterogeneity in driving the optimal tax. They find that even if only a small share of individuals have self-control problems, if internalities are large, the optimal tax on the full population can be large (when revenues are lump sum rebated). Thus, under both the standard model and this alternative, broad-based taxation of alcohol can be justified.

Of course, this may not be enough to sway public opinion! It is therefore worth considering whether more targeted tax policies towards alcohol are merited. One is to move to a purely alcohol-content based tax, rather than the rough approximations (taxes on beer vs. wine vs. spirits) used in most nations. This is a difficult issue, as noted in the Chapter, because different alcohol "delivery devices" have different potential for damage. For example, spirits have about eight times as much alcohol per unit volume as does beer. Yet individuals who so desired could consume more than six times as much alcohol in a short period of time drinking spirits than they could drinking beer. Technically, the appropriate basis for alcohol taxation might be something like blood alcohol content per unit time of concentrated drinking.

That said, within type of alcohol, there is clear scope for differential taxation by alcoholic content. For example, all U.S. states have only one tax on beer despite alcoholic content that varies from 4% (light beer) to 8% (dark beer). They also typically have just one tax rate on spirits despite alcoholic content that varies from liqueurs like Amaretto (28% alcohol) to grain alcohol (up to 95% alcohol).

A second approach is to consider differential taxation of alcohol in settings where it is differentially harmful. In the United States, for example, it seems reasonable to conjecture that much of the damage due to drunk driving involves individuals leaving drinking establishments rather than drinking at home. This might suggest differentially high taxes on alcohol served in establishments. To overcome political opposition from bar owners, the revenue could be redistributed to them through a one time tax credit to overcome their loss in asset value.

Obesity

Given the enormous growth in obesity in the U.S., it is rapidly becoming this nation's most important health problem. In principle, this issue could also be addressed with corrective taxation. But this is an even more challenging case than alcohol, and certainly more challenging than cigarettes, for three reasons.

First, damage from poor eating habits is not only non-linear – it is non-monotonic. Any food is unambiguously good for individuals who would otherwise starve, and it is only past a certain point that we would worry about the damage caused by overeating. Second, there remains considerable uncertainty in the science linking consumption of particular goods to the ultimate externalities and internalities of obesity. Finally, there remains uncertainty about the substitution patterns across inputs that might impact the shape of tax policy. If individuals, for example, substitute from fats to sugars when the former is taxed, is that obviously health-improving?

For all of these reasons, addressing obesity issues through taxes on inputs is very difficult. But the problem of obesity at least raises concerns about a common pattern of consumption taxation world-wide: excluding food from consumption taxes. For example, in the UK, most foodstuffs for home consumption are exempt from tax; similarly, in the U.S., food for home consumption is often excluded from state sales taxes. These exclusions can be clearly justified on distributional grounds, using a distribution-weighted approach to optimal commodity taxation.

Yet if there are obesity externalities from overeating, this provides a further rationale (along with relative inelasticity) against tax favoring foodstuffs. The UK VAT tries to address the obesity issue by standard-rating some food stuffs, such as ice cream. Yet other obesity-causing foodstuffs, such as cakes or chocolate chip cookies from a bakery, are zero-rated; potato-chips are standard-rated, yet tortilla chips are zero-rated. The difficulty of assigning obesity externalities to particular types of foodstuffs suggests that this is an extremely difficult approach to addressing them.

A better approach might be to follow the approach of a number of U.S. states, which is to include food at the standard sales tax rate, but to provide rebates to low-income families to approximate the burden of food taxation (Johnson and Lav, 1998). Since these rebates would not depend directly on food spending, this system does not provide a marginal subsidy to food consumption, while in theory preserving the redistributional properties of a food exemption. In practice, however, a problem with this approach is that the rebate typically falls below the taxation of food expenditures for low income families, as politicians do not sufficiently inflate the rebate to match the rise in food expenditures (Johnson and Lav, 1998).

Unlike the case with smoking (where you can't tax those with lung cancer) or driving (where you can't sufficiently tax those who kill others driving drunk), there is a feasible output based taxation mechanism here: taxing body fat. If direct scientific evidence shows a strong link between certain measures of body fat and health costs, then the tax system could include body weight taxes. Of course, such a system is more easily proposed than implemented. Proxies for body-fat, such as Body Mass Index (BMI), are only indirect; for example, African-Americans have a much higher BMI for any given level of body fat (Calle et al., 1999). And gathering data on even such proxies would be daunting.

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