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SHOULD SOFT DRINKS BE TAXED MORE HEAVILY?

Carlisle Ford Runge

JEL Classifications: H, H2, H25

Keywords: Soft Drink Taxes; Obesity; Substitution Effects

This article is part of a series of Policy Issues articles on Soda Tax. You can also find articles on [Can Taxing Sugary Soda Influence Consumption and Avoid Unanticipated Consequences?](#), [Sugar-Sweetened Beverage Taxation as Public Health Policy-Lessons from Tobacco](#), [Soda Taxes and Substitution Effects: Will Obesity be Affected?](#), [Better Milk than Cola: Soft Drink Taxes and Substitution Effects](#), [Evaluating Excise Taxes: The Need to Consider Brand Advertising](#), and [Caloric Sweetened Beverage Taxes: The Good/Food/Bad Food Trap](#) as part of this theme.

The articles in this theme consider a controversial policy issue: whether sweetened soda should be subject to increased taxation. The justification for such taxes relates both to economics and public health, but such taxes are hardly without critics. The authors of these articles are drawn from numerous fields: medicine, public health, economics, applied economics, political science, public affairs, and industry. They represent a cross-section of informed opinion and analysis that we hope will be helpful as the debate unfolds.

The first article, by physician Jason Block and Walter C. Willett of the Harvard Medical School and Harvard School of Public Health, respectively, broadly examines the current situation and whether sweetened soda consumption will decline in the face of tax increases—and by how much. They go on to examine possible unintended consequences, including a rise in unsweetened soda and other beverage consumption, each with their own special issues and problems.

The second article, by Frank Chaloupka, Lisa Powell, and Jamie Chriqui of the Departments of Economics and Political Science of the University of Illinois at Chicago, examines the lessons for soda from tobacco taxation. Worldwide tobacco taxes have reduced consumption and raised substantial revenue, often used to further reduce smoking. The authors conclude that sizable taxes on sweetened soda would also lead to significant reductions in consumption, reduce obesity and generate revenues available for further prevention and control, especially if designed consistently with the World Health Organization (WHO) best practices guidelines.

The third article, by Jason Fletcher of the Yale School of Public Health, closely examines the data on substitution effects from soda taxes. He finds that such a tax would encourage the substitution of juice and whole milk which are also quite caloric. The result is to blunt the effect of soda taxes in reducing obesity, unless substitutes are made less available, especially for children in schools. Although soda taxes may have minimal impacts on obesity, Fletcher concludes that they may still enhance public health by reducing the consumption of empty calories and preventing tooth decay.

The fourth article, by Carlisle Ford Runge, Justin Johnson, and Carlisle Piehl Runge of the University of Minnesota and Davenport College, Yale University, examines the theory of sin taxes and the evidence on substitution effects. Soda taxes are supported from a welfare-theoretic perspective, but raise questions over substitution effects. Citing Fletcher's earlier work, they argue that reduced soda consumption is a step forward in its own right. Moreover, milk-substitution responses, especially of reduced fat milk, have salutary effects compared to soda.

The fifth article, by Joshua Berning of the University of Connecticut at Storrs, considers whether a soda tax and its impact on prices may be offset by aggressive advertising by soft drink companies, which already spend tens of millions to market their products. These effects are not fully reflected in price-response assessments. Advertising can

affect not only demand elasticities, but the regressivity of excise taxes and their substitution effects. A converse case can also be made: advertising can be used to promote consumption of healthier foods.

The sixth and last article provides a perspective contrary to the others, reflecting Robbin S. Johnson's long experience in the private sector at Cargill. Johnson first notes the complexity and multifaceted nature of the food/obesity nexus and argues that soda taxes are a simplistic and ill-focused policy response. In addition to the problems of substitution, Johnson argues against facile comparisons of tobacco and soda taxes and in favor of fairer taxes and education efforts which might actually gain the support of soft drink manufacturers themselves.

Carlisle Ford Runge (frunge@umn.edu) is Distinguished McKnight University Professor of Applied Economics and Law, Department of Applied Economics, University of Minnesota.

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CAN TAXING SUGARY SODA INFLUENCE CONSUMPTION AND AVOID UNANTICIPATED CONSEQUENCES?

Jason P. Block and Walter C. Willett

JEL Classifications: H21, H23, H31

Keywords: Sugary Soda, Taxation, Obesity, Overweight, Weight Loss

This article is part of a series of Policy Issues articles on Soda Tax. You can also find articles on [Should Soft Drinks be Taxed More Heavily?](#), [Sugar-Sweetened Beverage Taxation as Public Health Policy-Lessons from Tobacco](#), [Soda Taxes and Substitution Effects: Will Obesity be Affected?](#), [Better Milk than Cola: Soft Drink Taxes and Substitution Effects](#), [Evaluating Excise Taxes: The Need to Consider Brand Advertising](#), and [Caloric Sweetened Beverage Taxes: The Good/Food/Bad Food Trap](#) as part of this theme.

Sugary soda intake has increased sharply over the last several decades among all age groups and is now the single most important source of calories in the United States. (Block, G., 2004; Nielsen and Popkin, 2004; Wang, Bleich, and Gortmaker, 2008). Because of evidence linking heavy consumption of these beverages to weight gain and adverse health outcomes (Malik, Schulze, and Hu, 2006; Vartanian, Schwartz, and Brownell, 2007; Vermunt, Pasmán, and Kardinaal, 2003), policy-makers and public health leaders are promoting soda taxes as a means to decrease consumption and raise funds for public health and obesity control programs (Brownell, K.D. et al., 2009; Brownell and Frieden, 2009). The push towards a soda tax has been buoyed by evidence of a declining price of soda (Brownell and Frieden, 2009; Duffey, K.J. et al., 2010). Because the inflation-adjusted price of soda has declined by as much as 48% over 20 years, a tax increase would have a small impact on the historical price, therefore, making its implementation more feasible.

Currently, 33 states have taxes on soda with an average tax rate of 5% (impactTEEN, 2011). Twenty one of these states have a tax specifically targeting soda, with an average of 6%; the other states have general taxes on food products that also apply to soft drinks. Currently, all of these states levy sales taxes on soft drinks, rather than excises taxes. Excises taxes, which are commonly proposed as the tax most likely to affect soda consumption, are levied by weight or volume of the product. In contrast, sales taxes are levied as a percent of the cost of the item (Brownell, K.D. et al., 2009). While the revenue benefits of these taxes seem clear (Center for Science in the Public Interest, 2011), the health impacts of such taxes remain uncertain. In this article, we discuss the possible benefits and unintended consequences of a sugary soda tax.

Will Tax Increases Affect Sugary Soda Consumption?

Several observational studies have estimated the potential impact of taxation on sales of sugary soft drinks. These studies typically have estimated the price elasticity of demand, which is a measure of the likely change in demand for—or sales of—a product that would result from a change in price. In an analysis based on surveys of households, Finkelstein and colleagues estimated that a tax on sugary soda would reduce demand, with a price elasticity of demand of -0.7, meaning that for every 10% tax, sales would fall by 7% (Finkelstein, E.A. et al., 2010). Results varied according to household income levels with elasticities ranging from -1.0 for households in the third income quartile and -0.5 in the lowest income quartile. Accounting for likely substitution of other sugary beverages for soda after a tax, they concluded that a 20% tax on sugary soda would result in an average decline of 4.2 kcal/day, 0.32 kg/year loss in body weight, and revenue generation of over \$800 million annually, with most of the price burden of a tax borne by higher-income groups. They projected a higher price burden on higher-income households because those with lower income are more likely to switch to low-cost sodas after price increases than higher-income households. A tax on all sugar-sweetened beverages, including “fruit drinks” and sports drinks, would lead to a greater effect on body weight and revenue. Duffey and colleagues found similar results when examining a cohort of adults followed

over 20 years, linked to regional pricing data, but found a larger impact on weight perhaps because they could not account for food and beverage substitution effects (Duffey, K.J. et al., 2010).

A review of 14 studies that provided estimates for the price elasticity of demand for soda, defined differently and often broadly, found a pooled elasticity of -0.8 with a range of -0.1 to -3.2 (Andreyeva, Long, and Brownell, 2010). Each of the studies included data from observational sources, including time-series data, household surveys, and food store scanners. When included studies were restricted to those that defined soda as “soft drinks, carbonated soft drinks, soda, and soda or fruit ades”, the elasticity was -1.0. Only one study in this review was available to compare the elasticity of sugary soda with that of low-calorie soda and showed that low-calorie soda is more elastic (Bergtold, Akobundu, and Peterson, 2004). Reasons for greater price responsiveness with low-calorie soda are unclear, and more studies would be needed to determine whether there is a true difference between these soda types. The overall elasticity for sugary soda was of a similar magnitude of that estimated for “food away from home”, juice, beef, and pork (Andreyeva, Long, and Brownell, 2010).

Observational data have limitations for determining the impact of a tax because of challenges in sorting out factors that influence both price and sales—supply and demand. Experimental data, when a price change is implemented by the research team, can better isolate the impact of the change on sales. We recently published an experimental study to estimate the price elasticity of demand for regular soda (Block, J.P. et al., 2010). During this experiment, we increased the price of regular soda by 35% in a hospital cafeteria in Boston, Massachusetts, for one month, after a two week baseline phase during which existing prices were posted. The price change was associated with a 26% reduction in sales of regular soda, translating to an elasticity of -0.7. This study also included an education phase, with posted educational materials on the health benefits of reducing sugary soda intake; this phase had no independent effect on soda sales.

The convergence of elasticity estimates from varying study designs and populations demonstrate a likely reduction in sales of approximately 8% from a 10% sugary soda tax. However, much remains unknown about the other impacts of a soft drink tax. While some studies demonstrate a likely reduction, though often quite modest, in weight from soda taxes (Duffey, K.J. et al., 2010; Finkelstein et al., 2010; Fletcher, Frisvold, and Tefft, 2010a; Schroeter, Lusk, and Tyner, 2008; Sturm, R. et al., 2010), others estimate no effect from existing state taxes on soda or proposed taxes (Fletcher, Frisvold, and Tefft, 2010b, 2010c; Powell, Chriqui, and Chaloupka, 2009). We also do not know if the elasticity will depend entirely on the level of the price change or whether the type of tax will determine its effectiveness. Perhaps soda sales will be inelastic to small price increases, which may not be noticed by consumers. Because of the salience of taxation, an excise tax also may be more effective than a sales tax (Brownell, K.D. et al., 2009). An excise tax would be more likely to be part of the actual item price whereby a sales tax may only be imposed at the register, after a consumer has made the decision to purchase the item (Chetty, Looney, and Kroft, 2009).

The effects of a soda tax on health may depend primarily on the substitution patterns of those who cease buying soda as a result of a tax. Existing literature is uncertain about the effects of a soda tax on other beverage or food consumption. In an analysis of state soft drink taxes, Fletcher, Frisvold, and Tefft (2010b) found evidence that whole milk consumption rose among children and adolescents in response to soda sales taxes, possibly offsetting the benefits of a reduction on sugary soda sales on weight because of the similar calorie content of soda and whole milk. However, other benefits of a substitution by whole milk, such as improving intake of calcium and vitamin D, may result, especially for children who are vitamin D deficient (Mansbach, Ginde, and Camargo, 2009). They did not examine water as a possible substitute for soda and found no evidence for changes in juice consumption after soda taxes; authors did not speculate on why they did not see such a juice substitution. In our experiment in the hospital cafeteria, we found some suggestion that customers chose diet soda as an alternative after we increased the price for sugary soda (Block, J.P., 2010). Specifically, we found an increase in sales of diet soda of 20% when we raised the price of regular soda by 35%—and during that time we found a 26% drop in regular soda sales—but no effect on water sales. However, we also saw some changes in diet soda sales at a comparison site, at which there were no interventions, suggesting that perhaps the diet soda sales changes reflected more of a temporal trend than an actual response to our intervention. Coffee sales significantly increased after we raised the price of regular soda as well. Perhaps our results on substitutes were different than prior studies because our study focused on adults, in contrast to that by Fletcher, Frisvold, and Tefft, which focused on children and adolescents. Coffee and diet sodas may be more appealing to adults than children.

Concern remains that sugary beverage substitutes, such as juices or sugar-sweetened water, could be a substitute for soda after taxation, especially because of the increasing popularity of these drinks over the course of time (Nielsen and Popkin, 2004; Wang, Bleich, and Gortmaker, 2008). Further research should examine the actual

impacts of levels and structure of taxation through experiments that may also examine taxation effects on weight as well as any beverage substitution patterns that could offset benefits of taxation.

Unintended Health Consequences of Soda Taxes from Switching to Diet Drinks

Despite limited evidence that customers would consider switching to artificially-sweetened beverages after taxation, these beverages are often recommended alternatives for sugary soda. Thus, understanding the potential health effects of this potential substitution is critical. Despite some disagreement by beverage industry-supported persons (Allison and Mattes, 2009), the weight of evidence demonstrates clearly that sugary soda has a negative impact on health (Dhingra, R. et al., 2007; Palmer, J.R. et al., 2008; Schulze, M.B. et al., 2004). Systematic reviews of studies have found that sugary soda consumption is associated with higher energy intake and weight gain among both adults and children and an increased risk of diabetes among adults (Malik, Schulze, and Hu, 2006; Vartanian, Schwartz, and Brownell, 2007; Vermunt, Pasman, and Kardinaal, 2003). Intriguing experimental data from DiMeglio and Mattes (2000) found that sugary beverages may be more harmful than solid sugar. In a crossover experiment, 15 subjects consumed either 450 calories per day of regular soda or jelly beans. During the time they consumed the regular soda, total daily calorie intake increased and subjects gained weight, suggesting that other calorie intake was not offset by the soda intake. In contrast, during the jelly bean phase, there was no change in total daily calorie intake because subjects compensated by reducing their intake of other foods.

However, concerns have arisen that artificially-sweetened beverages may be as harmful, if not more so, than sugary beverages. Among 9,514 subjects followed for a mean of nine years, Lutsey, Steffen, and Stevens (2008) found that high consumption of diet soda was associated with a 34% increased risk of developing metabolic syndrome in adjusted analyses. Consumption of sugary beverages, which included regular soda and juices, was also associated with development of metabolic syndrome in early models but not in the fully-adjusted final model controlling for demographics, behaviors, and other food intake. Similar results were found in a cross-sectional study of 6,154 subjects. Subjects drinking one or more diet soft drinks daily had a 53% higher risk of metabolic syndrome than those drinking less than 1 diet or regular soft drink per week (Dhingra, R. et al., 2007).

Other studies have examined the link between consumption of these beverages and diabetes. In a study of 5,011, Nettleton and colleagues found a 38% higher risk of developing diabetes over a period of up to seven years for subjects consuming one or more diet sodas daily, compared to none (Nettleton, J.A. et al., 2009). Associations of diet soda consumption with the development of metabolic syndrome were not significant in final models controlling for adiposity as well as demographic and behavioral factors.

When all of these studies are considered together, it appears that many, if not all, of the apparent adverse effects reported for artificially sweetened beverages may be due to reverse causation—individuals may switch to artificial sweeteners because of weight gain or blood glucose abnormalities. The studies that properly account for possible reverse causation, by using longitudinal data on subjects over time and controlling for dieting behaviors and weight, find no clear association between artificially-sweetened beverage consumption and metabolic risk. For example, a study of over 91,000 subjects in the Nurses' Health Study found no increased incidence of diabetes among high consumers of artificially-sweetened beverages; authors did find higher incidence of diabetes among high consumers of sugar-sweetened beverages (Schulze, M.B. et al., 2004). Similar relationships were also seen in a large prospective study of men (de Koning, L. et al., 2011).

Several hypotheses have arisen to explain potential associations between artificial sweeteners and metabolic disorders: the promotion of hunger (Blundell and Hill, 1986; Rogers and Blundell, 1989; Tordoff and Alleva, 1990b) or the overcompensation of food intake because of miscalculation of the calorie deficit achieved by consumption of diet soda. However, evidence for these pathways has not been borne out through investigation. Repeated experimental studies have found no significant effect of consumption of artificially-sweetened food or beverages on hunger, calorie consumption, macronutrient preferences, or general food appeal, when compared to sugar-sweetened foods, water, or sugar-sweetened beverages (Black, R.M. et al., 1991; Rolls, Hetherington, and Laster, 1988; Rolls, Kim, and Fedoroff, 1990). In fact, several of these studies demonstrate clearly that consuming sugar-sweetened beverages or food, prior to or during a meal, leads to overall more calorie consumption than when consuming artificially-sweetened beverages or food because of the higher calorie content of the sugar-sweetened item (Anton, S.D. et al., 2010; Rolls, Kim, and Fedoroff, 1990). For example, a study of 19 normal weight—body mass index [BMI] 18.5 – 25 kg/m²—and 12 obese—BMI ≥ 30 kg/ m²—subjects tested whether eating an appetizer sweetened with sucrose, aspartame or stevia—a sweet calorie-free botanical product—affected post-appetizer food consumption (Anton, S.D. et al., 2010). Post-appetizer food consumption was equivalent regardless of which appetizer was consumed, and total daily calorie consumption was higher when consuming the sucrose appetizer because of its higher calorie content compared to the aspartame and stevia appetizers. Similar results have been found in studies of children (Anderson, G.H. et al.,

1989; Birch, McPhee, and Sullivan, 1989). Longer term studies, but still only 10 weeks or less, have found consistent results, demonstrating reduced energy intake when sugar sweeteners are replaced by artificial sweeteners (Naismith and Rhodes, 1995; Porikos, Hesser, and van Itallie, 1982; Raben, A. et al., , 2002; Tordoff and Alleva, 1990a).

Studies also have examined the impact of artificial-sweetened or sugary beverages on weight gain. Among 91,249 subjects in the Nurses' Health Study, followed between 1991 and 1998, no excess weight gain was evident among consumers of artificially-sweetened soda (Schulze, M.B. et al., 2004) but was among high consumers of sugar-sweetened beverages. In a much-smaller study of 3,682 subjects in the San Antonio Heart Study, followed for seven to eight years, consumption of artificially-sweetened beverages was associated with a 47% increase in BMI compared to non-drinkers (Fowler, S.P. et al., 2008). This study did not comment on sugary soda intake.

Controlled studies that compare consumption of artificial sweeteners with sugar sweeteners have generally found weight loss with artificial sweeteners (Raben, A. et al., 2002; Tordoff and Alleva, 1990a). The longest trial to date to employ an artificial sweetener as part of a weight loss intervention was a study of 163 obese women who participated in a 19-week multidisciplinary weight-loss program (Blackburn, G.L. et al., 1997). The subjects were split into two groups with instructions to either abstain or use aspartame as part of their weight control strategy for 16 of the 19 weeks and during the two years following the completion of the active weight loss program. Women in both groups achieved similar weight loss during the active weight loss phase, but those in the aspartame group had less weight regain over the two years of follow-up and achieved more weight loss at the end of this period than the group abstaining from aspartame.

Systematic reviews that have assessed the metabolic and weight loss effects of artificial sweeteners compared to sugar sweeteners have concluded that the overall evidence supports no difference in effect on hunger, satiety, or food consumption following use of these products (Malik, V.S. et al., 2006; Mattes and Popkin, 2009; Renwick, A.G., 1994; Vermunt, Pasman, and Kardinaal, 2003). Also, they conclude that weight loss appears to follow transition from sugar-sweeteners to artificial sweeteners but stop short of endorsing the use of artificial sweeteners as a weight loss strategy because of some remaining concerns about their safety. Ongoing research examining relationships between artificial sweeteners and risk for cancer and preterm delivery will provide useful information on other potential negative health impacts of these sweeteners.

Concluding Thoughts

Taxing soda could serve an important role in generating revenue as well as impacting health. However, the explicit effects on health are unclear because of uncertainty about the patterns of beverage substitution. More research, especially experimental evidence, is needed to explore the level and type of tax that would be required to decrease consumption and how substitutions may impact overall calorie consumption and weight. However, transition to artificially-sweetened beverages due to a sugary soda tax would likely be associated with reduced weight and risk of diabetes. We still don't know if other negative health consequences might be associated with this transition, especially for children, and potential harms should be part of the consideration of unintended consequences of a soda tax. Despite no evidence to support likely substitutions of water for soda, perhaps any soda tax should be accompanied by an educational campaign to encourage people to choose water as the best alternative to soda.

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Jason P. Block (Jason_block@harvardpilgrim.org) is an Instructor in the Obesity Prevention Program, Department of Population Medicine, Harvard Medical School/Harvard Pilgrim Health Care Institute. Walter C. Willett (wwillett@hsph.harvard.edu) is a Professor in the Departments of Nutrition and Epidemiology, Harvard School of Public Health, and the Channing Laboratory, Department of Medicine, Brigham and Women's Hospital, Harvard Medical School.

The views expressed are those of the authors and do not necessarily reflect the positions of the Federal Reserve Bank of Kansas City, the Federal Reserve System, or Purdue University.

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SUGAR-SWEETENED BEVERAGE TAXATION AS PUBLIC HEALTH POLICY-LESSONS FROM TOBACCO

Frank J. Chaloupka, Lisa M. Powell, and Jamie F. Chriqui

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Keywords: Taxation, Tobacco, Obesity

This article is part of a series of Policy Issues articles on Soda Tax. You can also find articles on [Should Soft Drinks be Taxed More Heavily?](#), [Can Taxing Sugary Soda Influence Consumption and Avoid Unanticipated Consequences?](#), [Soda Taxes and Substitution Effects: Will Obesity be Affected?](#), [Better Milk than Cola: Soft Drink Taxes and Substitution Effects](#), [Evaluating Excise Taxes: The Need to Consider Brand Advertising](#), and [Caloric Sweetened Beverage Taxes: The Good/Food/Bad Food Trap](#) as part of this theme.

Taxes as Public Health Policy

The success of higher tobacco taxes in reducing cigarette smoking, other tobacco product use, and the death, disease, and economic costs caused by tobacco use is a key factor in explaining interest in using sugar-sweetened beverage (SSB) taxes as a policy tool for curbing the obesity epidemic in the United States (Brownell and Frieden, 2009). A large, global, and growing evidence base clearly demonstrates that higher cigarette and other tobacco product taxes lead current users to quit, keep former users from restarting, prevent young people from taking up tobacco use, and reduce consumption among those who continue to use (International Agency for Research on Cancer (IARC), in press). At the same time, tobacco tax increases generate considerable new revenue which some governments use to support comprehensive tobacco control programs that lead to further reductions in tobacco use and its consequences. This paper briefly reviews the findings from research on the effectiveness of higher tobacco taxes in reducing tobacco use, as well as the evidence addressing the frequently used arguments raised in opposition to tobacco tax increases; highlights the “best practices” in tobacco taxation; and discusses the implications for SSB taxes.

Tobacco and SSB Taxation

Taxes on tobacco products are ubiquitous. The United States and nearly every other nation’s government around the world levies taxes on tobacco products, including excise and other tobacco-specific taxes, value added or sales taxes, and import duties (World Health Organization (WHO), 2010). Every U.S. state imposes an excise tax on cigarettes, and all but Pennsylvania levy excises on other tobacco products. Currently, the federal cigarette excise tax is just over \$1.00 per pack and state cigarette excise taxes range from a low of 17 cents per pack in Missouri to \$4.35 per pack in New York. Many localities levy additional excise taxes, with local cigarette taxes that add as much as \$2.68 per pack in Chicago—including both city and county taxes—and \$1.50 per pack in New York City. In the vast majority of states with sales taxes, the tax is applied to tobacco product prices inclusive of excises. Over the past decade, the federal government and all but a handful of states have increased their tobacco excise taxes, with many states adopting multiple and sizable increases. Since 1990, average state cigarette excise taxes have risen nearly five-fold, while the federal tax has gone up more than six-fold. As a result of these substantial tax increases, inflation-adjusted prices of cigarettes and other tobacco products have risen dramatically, with taxes in the U.S. accounting for well over 40% of retail cigarette prices, inclusive of all taxes. In countries that have been even more aggressive in raising tobacco taxes over the past few decades, these taxes account for 75% or more of prices.

In contrast, very few governments, including seven U.S. states, levy small taxes that are unique to soft drinks and other non-alcoholic beverages, and almost none of these, including the few state taxes, apply only to sugar-sweetened beverages (Chriqui, et al., 2011). However, most governments do impose their value added or sales

taxes on a variety of beverages, with about two-thirds of U.S. states levying sales taxes on carbonated soft drinks (Bridging the Gap, 2011). Again, none of these differentiate sugar-sweetened from unsweetened or artificially sweetened beverages. Given the low sales tax rates in the United States, these taxes add very little to retail prices, on average accounting for less than 5% of the tax inclusive price.

Taxes, Prices, Use, and Consequences

Historically, tobacco taxes were primarily used to generate revenue, but the tax increases of the past two decades have increasingly resulted from policymakers' interests in using higher taxes to improve public health by reducing tobacco use and its consequences. A few decades ago, conventional wisdom held that tobacco use and other addictive behaviors were unresponsive to changes in prices. Since then, hundreds of studies by economic, public policy and public health researchers have clearly demonstrated that tobacco use does indeed follow the basic laws of economics and that higher tobacco product prices reduce tobacco use.

For the United States and other high-income countries, most studies assessing the impact of taxes and prices on tobacco use find that a 10% increase in the price of tobacco products will reduce overall tobacco use by 2% to 6% (IARC, in press). Studies based on individual-level survey data find that about half of the estimated reduction in overall consumption following a price increase results from reductions in the prevalence of tobacco use, largely reflecting increased quitting. Estimates indicate that a 10% price increase leads about 10% of smokers to try to quit smoking, with about 2% successful in doing so (IARC, in press). Numerous studies find that tobacco use among young people is particularly sensitive to price, with most studies concluding that reductions in their tobacco use are 2-3 times larger than the reductions in adult use (IARC, in press). Higher tobacco product prices lower youth tobacco use through reduced initiation and uptake, and are particularly effective in preventing young people from moving beyond experimentation and into regular tobacco use. Similarly, and consistent with economic theory, most studies from the United States and other high-income countries find that less educated and lower income populations are also more responsive to price (IARC, in press). Finally, a small but growing number of studies have demonstrated that increases in tobacco taxes and prices and the reductions in use that result lead to reductions in the death, disease, and economic costs caused by tobacco use (IARC, in press).

In contrast to the well-developed literature on taxes, prices and tobacco use, research on the impact of SSB and other beverage tax and prices on beverage consumption and its consequences, most notably obesity, is still in its infancy. Several studies show that beverage consumption responds to price, with estimates from these studies indicating that a 10% increase in beverage prices reduces overall consumption by about 8% (Andreyeva, Long, and Brownell, 2010). Fewer studies have looked at how changes in the prices of some beverages relative to the prices of others affect consumption patterns, generally finding that relative price changes result in substitution from consumption of those for which relative prices have risen to those that are relatively less costly (Lin, Smith, and Lee, 2010; and Fletcher, Frisvold, and Tefft, 2010). However, estimates of the extent of substitution among beverages are quite variable and lead to markedly different conclusions about the impact of SSB tax and price increases on overall caloric intake and weight outcomes. Studies that look directly at the impact of beverage taxes on weight outcomes, including indicators of obesity, find little or no impact of existing taxes on these outcomes, with some researchers attributing this to the low current tax rates described above (Sturm, et al., 2010; and Powell, Chriqui, and Chaloupka, 2009) while others attribute it to substitution to other caloric beverages (Fletcher, Frisvold, and Tefft, 2010). As with tobacco, a few studies that have looked at vulnerable populations—including young people, those on lower incomes, and those already at higher weight—generally find that consumption and weight outcomes in these populations are more responsive to prices (Powell and Chriqui, in press).

Political Economy of Tobacco and SSB Taxation

A variety of arguments have often been raised in opposition to higher tobacco taxes by tobacco companies and their allies. Over the past few years, beverage companies and their allies have begun making some of the same arguments in opposition to SSB taxes. These arguments tap into the growing anti-tax, anti-government intervention sentiment reflected in the recent rise of the Tea Party in the United States; fears that tobacco and beverage taxes will result in job losses, black markets and other economic consequences; and concerns that these taxes will harm the poor (Brownell and Warner, 2009; and Chaloupka, in press). For tobacco taxes, the evidence clearly demonstrates that these arguments are either false or overstated; similar evidence is only beginning to emerge for SSB taxes.

While popular support for taxation is generally low, polling data consistently show significant, broad-based support for higher tobacco taxes that cuts across party lines (Campaign for Tobacco-Free Kids (CTFK), et al., 2010). Moreover, as many as two-thirds of voters, including a significant share of tobacco users, support sharp increases in tobacco taxes that dedicate some of the revenues generated by these taxes to programs that help adults quit and prevent

youth from taking up tobacco use (CTFK, 2010). As experiences show in California, Massachusetts, Arizona and many other states that earmark tobacco tax revenues for tobacco control programs, these programs add to the impact of higher taxes and lead to further reductions in tobacco use (Chaloupka, 2010). As the Centers for Disease Control and Prevention (CDC) describe, the “best practices” for comprehensive tobacco control programs include: state and community interventions that support tobacco control policy development and implementation; mass media and other health communication interventions to inform people about the harms caused by tobacco use; support for cessation among tobacco users interested in quitting; and effective surveillance, evaluation, and program management (CDC, 2007). While support for SSB taxes is more variable, there is majority support in many jurisdictions, particularly when the revenues that would be raised by an SSB tax are dedicated to obesity prevention programs (Rudd Center, 2011).

Fears about the economic consequences of tobacco taxation are similarly false or overstated. Research has demonstrated that higher tobacco taxes generally have no net impact on jobs as tobacco use falls (e.g. Warner, et al., 1996). Job losses in tobacco-dependent sectors of the economy are offset by job gains in other sectors as money no longer spent on tobacco products is spent on other goods and services and as the government spends new tobacco tax revenues, typically on more labor-intensive activities. Convenience stores and other merchants selling tobacco products are not put out of business as they likely raise prices by more than the amount of the tax increase to compensate for lost sales of tobacco products and see sales of other products rise (Huang and Chaloupka, in press). While tax increases do create incentives for tax avoidance and tax evasion, they continue to reduce tobacco use while generating new revenues (Merriman, Yurekli, and Chaloupka, 2000). Moreover, there are effective strategies available to governments for curbing tax avoidance and evasion in order to maximize the public health and revenue impacts of higher tobacco taxes (WHO, 2010; and Chaloupka, et al., in press). To date, opponents of SSB taxes have focused on the impact of these taxes on jobs in the beverage sector (Hahn, 2009). Ongoing research looking at the employment of SSB taxes that accounts for the job gains in other sectors due to changes in consumer and government spending, as well as the substitution to other untaxed beverages produced and bottled by the same companies, is likely to produce findings similar to those that demonstrate that higher tobacco taxes do not result in significant job losses and could even lead to a net increase in jobs.

Concerns about the impact of tobacco taxation on the poor have more merit. These concerns arise from the fact that existing tobacco taxes fall most heavily on the poor given the greater prevalence of tobacco use in lower socioeconomic populations. At the same time, these populations are most susceptible to the health and economic consequences of tobacco use, with tobacco use explaining a significant part of socioeconomic disparities in health (Bobak, et al., 2000). Given the greater response to price by low-income tobacco users, higher tobacco taxes can reduce the relative burden of these taxes on the poor given the larger reductions in their tobacco use compared to those among higher income populations, while the poor would receive relatively more of the health benefits that result from higher taxes (Chaloupka, et al, 2000; IARC, in press). Moreover, concerns about the impact of tobacco taxes on low-income smokers who continue to smoke despite higher cigarette prices have been addressed by dedicating some of the new tax revenues to programs targeting the poor, including those subsidizing tobacco cessation programs and products, expanding public health insurance programs, and other health promotion efforts. A similar approach that dedicates a portion of the revenue generated from SSB taxes to efforts to reduce and prevent obesity among the most disadvantaged populations could be used to alleviate concerns about the impact of an SSB tax on the poor. This could include expanding subsidies for fruits and vegetables in food assistance programs, providing weight loss programs and treatments to those on low incomes, and other such efforts.

Taxation as Public Health Policy - Best Practices

Based on global experiences with a variety of tobacco tax structures, levels, and changes over time, WHO has developed a set of “best practices” for tobacco taxation as part of its *WHO Technical Manual on Tobacco Tax Administration* (WHO, 2010). Many, if not all, of these best practices, briefly discussed in this section, appear equally applicable to SSB taxes. Among the most relevant of these best practices are:

- Using excise taxes to achieve public health goals. WHO emphasizes excise taxes rather than sales or ad valorem taxes given that these are the taxes that will differentiate the relative prices of tobacco products from other products, something that would be true for SSB excise taxes and their prices. Moreover, WHO highlights the use of tobacco excise taxes to promote public health, while recognizing that these taxes will generate sustained revenues in the short- to medium- term— a principle that seems appropriate for SSB taxes as well.
- Relying on simple, specific excise tax structures that apply equally to all products. Specific, or per unit, tobacco excises have a greater public health impact than do ad valorem, or price based, excises given that they apply equally to all tobacco products and, as a result, minimize gaps in prices among similar products

as well as opportunities for substitution to cheaper brands/products in response to tax increases. For SSB taxes, this implies a tax based on volume or added sugars that would be the same on all sugar-sweetened beverages, from carbonated and other soft drinks to sports drinks, energy drinks, and flavored waters.

- Increasing specific excise taxes regularly to keep pace with inflation and to reduce affordability. The value of specific taxes will be eroded over time by inflation unless these taxes are regularly increased. Moreover, increases in income can make taxed products increasingly affordable. A couple of countries—Australia and New Zealand— automatically increase their specific tobacco taxes to keep pace with inflation, while other governments—most notably the United Kingdom—adopted annual tax increases that raised inflation-adjusted cigarette prices year after year. Similar approaches could be applied to SSB taxes.
- Using excise taxes as part of a comprehensive approach that includes dedicating a portion of tax revenues to control programs or health promotion efforts. This is based on evidence that comprehensive strategies that include tax increases lead to greater reductions in tobacco use than do tax increases alone. Funding such comprehensive programs with the revenues from tobacco taxes maximizes the public health impact of the tax while building public support for higher taxes. Polling data suggest that the same is true for SSB taxes—that dedicating SSB tax revenues to obesity prevention and control programs builds public support by providing a source of much-needed revenues for such efforts.
- Not allowing concerns about economic consequences of taxes prevent tax increases. As discussed above, oppositional arguments which raise fears that higher tobacco taxes result in significant job losses, black markets in tobacco products, and harm the poor are either false or overstated. The same appears likely for arguments used in opposition to SSB taxes.
- Strengthen tax administration so as to minimize tax avoidance and tax evasion and maximize the public health and revenue impacts of tax increases. Adoption of new technologies that monitor production, allow tracking and tracing of tobacco products through the distribution chain, and facilitate enforcement, combined with licensing of all involved in tobacco product manufacturing and distribution, have been demonstrated to be effective in reducing tobacco tax avoidance and evasion, with a greater impact when coupled with increased enforcement and swift and severe penalties. While concerns about avoidance and evasion of SSB taxes have not been prominent in the debate over these taxes, similar approaches could be adopted in order to ensure strong SSB tax administration.

Taxes Could Be An Answer

Sizable tobacco excise tax increases are widely viewed as the single most effective strategy for reducing tobacco use and its consequences. Research consistently demonstrates that these higher taxes lead current users to quit, keep former users from restarting, prevent young people from taking up tobacco use, and reduce tobacco consumption among those who continue to use. At the same time, these taxes generate significant revenues that can be used to support additional, effective interventions to reduce tobacco use and the death, disease and economic costs it causes. This evidence has led numerous national, state and local governments to significantly increase their tobacco taxes over the past two decades, pushing youth and adult tobacco prevalence rates to their lowest levels in decades. The success of tobacco taxation as a public health policy, when coupled with the increased awareness of the role of SSBs in causing a variety of health consequences and in contributing to the obesity epidemic in the United States, has led to calls for governments to adopt significant SSB taxes. Proposals for such taxes have been highly controversial, with the beverage industry and other opponents using many of the same false or misleading arguments used by tobacco companies and their allies in opposition to tobacco taxes. While evidence on the impact of SSB taxes in reducing obesity is mixed and research addressing most oppositional arguments has yet to emerge, the experiences with tobacco taxes suggest that sizable SSB taxes would lead to significant reductions in SSB consumption and its direct health consequences. They almost certainly would reduce obesity, while generating revenues that could fund other obesity prevention and control programs, raising support for such taxes. Implementing SSB taxes following the best practices WHO has outlined for tobacco taxes would maximize the public health and revenue impact of these taxes.

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Frank J. Chaloupka (fjc@uic.edu) is a Distinguished Professor of Economics and the Director of the Health Policy Center at the University of Illinois at Chicago. Lisa M. Powell (powelll@uic.edu) is a Research Professor of Economics and Senior Research Scientist in the Health Policy Center at the University of Illinois at Chicago. Jamie F. Chriqui (jchriqui@uic.edu) is a Research Associate Professor of Political Science and Senior Research Scientist in the Health Policy Center at the University of Illinois at Chicago. This paper was funded in part by the Robert Wood Johnson Foundation under its grant to the University of Illinois at Chicago for the Bridging the Gap research program's ImpacTeen project.

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SODA TAXES AND SUBSTITUTION EFFECTS: WILL OBESITY BE AFFECTED?

Jason Fletcher

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This article is part of a series of Policy Issues articles on Soda Tax. You can also find articles on [Should Soft Drinks be Taxed More Heavily?](#), [Can Taxing Sugary Soda Influence Consumption and Avoid Unanticipated Consequences?](#), [Sugar-Sweetened Beverage Taxation as Public Health Policy-Lesson from Tobacco](#), [Better Milk than Cola: Soft Drink Taxes and Substitution Effects](#), [Evaluating Excise Taxes: The Need to Consider Brand Advertising](#), and [Caloric Sweetened Beverage Taxes: The Good/Food/Bad Food Trap](#) as part of this theme.

Although the United States has a relatively long history of taxing soft drinks, it has only been in the past decade that public health experts have focused on this policy as a way of potentially curbing the growing prevalence of obesity for both adults and children (Jackson and Brownell 2000; Brownell and Frieden 2009; and Andreyeva, Long, and Brownell, 2010). This recent focus has occurred for many reasons, including the large amounts and increases in soft drink consumption; increases in obesity, against the backdrop of ineffective policy responses; and the considerable success of tobacco taxes in reducing tobacco use in the previous decades. These factors point to a need to craft policy interventions to combat obesity and a compelling example to guide a policy of taxation related to specific types of consumption.

Soft drinks and the larger group of sugar-sweetened beverages (SSBs) appear to be reasonable targets because they are often considered to be "empty calories"—a category of consumption with very little nutritional value—and because they are a surprisingly large category of caloric intake for both adults and children. Putnam and Allshouse (1999) report that soft drink consumption has increased by almost 500% in the past 50 years, and recent data suggest it represents 7% of overall energy intake in adults and often larger proportions in children (Block, 2004). For example, Wang, Bleich, and Gortmaker (2008) estimate a 16% share of calories in youth ages 12-19 and 11% in children ages 2-11. However, some evidence points to recent reductions in soda consumption among some groups (Welsh, et al., 2011).

Indeed, soft drink taxation has been an increasing focus of state legislatures across the United States. Soft drink tax legislation was filed in 17 states between January 2009 and May 2010 (Yale Rudd Center for Food Policy and Obesity, 2010). While many of these bills failed, there is growing support from the public and health experts for such a tax. Additionally, as of the first quarter of 2011, over a dozen states were considering new excise taxes on SSBs in the legislative session. The benefits are touted to be widespread, including increased tax revenues, reductions in unhealthy beverage consumption, a reduction in obesity and associated illnesses such as diabetes, and potential downstream effects on the labor market and medical utilization and expenses. With this list of potential benefits, it is important to highlight obesity's role in the policy debate—while it is the clear focus of public health officials, other benefits of a potential soda tax should not be ignored, including those commonly discussed as well as more distal effects, such as improved dental health through reductions in sugar consumption. The focus on obesity is an important issue in this debate because much of the available evidence suggests that soda taxation may have negligible effects on obesity. If obesity was the main reason to consider taxation, then this evidence may imply that soda taxes may be unwarranted. However, a broader perspective on the potential health and economic gains from such a tax should be considered in evaluating this policy option.

Uncertainty about Effectiveness of Soft Drink Taxation to Reduce Obesity

On one hand, the potential benefits of soda taxation on obesity seem quite straightforward. We know that soda consumption is an important share of total consumption, and ample evidence suggests that maintained reductions in consumption of approximately 100 calories per day—less than a can of soda—could halt weight gain for 90% of the population (Hill, et al., 2003). Thus, basic economic theory suggests that raising the price of soda would reduce consumption and reduce population weight. This intuition is buttressed by the history of tobacco taxation, where price increases in cigarettes and other tobacco products have appeared to substantially reduce consumption. On the other hand, there is now ample research that examines the association between the level of state soft drink taxes—or soft drink prices—and obesity rates and found no effect (Fletcher, Frisvold, and Tefft, 2010 a, b, c).

The answer to this apparent discrepancy between intuition and empirical evidence may be quite simple—substitution effects. This becomes more apparent when we consider the important differences between the consumption of tobacco and soda. In a sense, the different results between tobacco and soda taxation are a matter of the definition of policy goals and in considering precisely what desire is being satisfied for individuals who consume tobacco or soda. For tobacco, we might think that the demand the product satisfies is somewhat narrow, mainly nicotine, and the policy of tobacco taxation was aimed at reducing consumption. For soda, the demand for the product seems broader, including its sweetness/sugar and its calories. This basic difference suggests a smaller ability for soda taxation to reduce the quantity of sugar/calories because of the many opportunities for substitution to other products. In contrast, it is more straightforward to tax the larger class of products containing nicotine and potentially reduce its consumption.

In emerging results, this substitution effect seems to answer the question of why taxes seem to lead to soda consumption reduction but not lower obesity rates. Fletcher, Frisvold, and Tefft (2010c) use the National Health and Nutrition Examination Survey (NHANES) dietary data to show evidence that, while individuals in states with higher soda taxes have lower soda consumption, these individuals completely offset the reductions in calories from soda by consuming other high-calorie beverages, such as milk and juice. This evidence is consistent with the view that individuals demand calories each day, and if the price increases on one mechanism of attaining calories (soda) then individuals shift their consumption relatively easily to satisfy their demand. These results are not without controversy, though, as research that uses simulation methods, and assumes lower levels of substitution to high-calorie drinks, suggests that soda taxes could reduce obesity (Smith, Lin, and Lee, 2010).

The clear and intuitive substitution effect found in Fletcher, Frisvold, and Tefft (2010c) has implications for the type of policies that we might then suggest to reduce obesity in the population. Broader taxes on higher calorie products would appear to allow less substitution than narrow taxes. However, an issue with this approach is the number of healthy high-calorie products—for example, milk and juice—that would be difficult to motivate including in the tax category. A more general excise tax on added sugar may serve to shift consumption to alternative products.

Related to the issue of substitution, a second potential limitation with the discussion of soda taxation in policy circles is the insistence on comparing the debate surrounding soda taxes to the debate and eventual success of tobacco taxes. While there are clear similarities with how public perception has changed over taxation, as well as how the relevant industry has lobbied against the imposition of taxes, there are also some key differences. Unlike soda consumption, there is no completely safe level of tobacco consumption. While there are likely to be health consequences for any level of tobacco use, it is only excess calories from soda that increase weight. In this way, the issue of soda taxation may be more similar to that of alcohol taxation than to tobacco taxation. In both cases, the health consequences seem to be specific to heavy or excessive consumption, but moderate consumption may pose no health risk. This is an important distinction because an evaluation of the success of the policy of taxation would need to center on reductions in problem users rather than reductions in moderate users. Indeed, in the case of alcohol taxes, Manning, Blumberg, and Moulton., (1995) found that only moderate drinkers—and not problem drinkers—reduce consumption when alcohol taxes increase. This undercuts the public health goals of the policy because it penalizes responsible users and has no effect on the problem users and the associated externalities, such as drunk driving. Similarly, we may be concerned whether any reductions in soda use are coming from individuals who are consuming excess calories, or those with otherwise healthy diets and weights. There is currently very little evidence related to this research question.

New Tax Policy Proposals and the Potential for Obesity Reductions

A primary limitation in the current research examining the effects of soda taxation on obesity is the limited policy variation that is available. While most states tax soda either through excise taxes or through sales taxes—the rates are currently quite low and they are not often clear to the public. Because many states use the sales tax instead of an excise tax, consumers do not see the tax in the posted shelf price—it is added at the register. Thus, some consumers may not know they are being taxed differentially for soda. In addition, the low rates of soda taxation may be below some critical (and unknown) threshold where consumers react. Fletcher, Frisvold, and Tefft (2010c) show reductions

in soft drink consumption associated with soda taxes in NHANES data of about 6 calories per day for each 1-cent increase in tax. So, there is evidence of some reaction, but it is counteracted through substitution to other high-calorie drinks. These small (and “hidden”) tax rates on soda have led many proponents to suggest that only large taxes will reduce obesity rates. The claim is that when consumers know they are being taxed—and taxed heavily—they will react by lowering soda consumption and will, thus, over time, lose weight. The key assumption with this claim is the existence of a threshold of taxation where substitution patterns abruptly shift. Indeed, many proponents of increased soda taxation assume that over one-third of soda consumption is shifted to water, which has zero calories, if there is an 18% to 20% increase in soda taxes. Of course, this could be true—there could be a threshold effect in consumers’ substitution patterns. However, there seems to be no evidence for the existence of a threshold, and this implicit assumption in many proponents’ analyses is often not discussed.

Ongoing Policy Considerations

The simplicity of the reason that soda taxation appears to be ineffective in reducing obesity is both vexing for current policy efforts but also potentially useful for future policy efforts. While currently proposed soda taxes likely will not overcome the issue of substitution, it might be constructive for future policies to focus attention on this particular component of the pathway between commodity prices and eventual weight. Specifically, efforts to constrain the availability of substitutes, particularly for children, may serve as a useful complement to ongoing policies aimed at reducing obesity. As an example, Fletcher, Frisvold, and Tefft., (2010a) show that children in schools subjected to vending machine restrictions drink the same number of soft drinks as those in schools with no restrictions, again suggesting the issue of substitution effects. That is, most students have multiple avenues to purchase soft drinks in schools in addition to vending machines, such as school stores, cafeterias, and the like. But a more comprehensive policy that removed soda from all school facilities and substituted water may serve to reduce soda consumption in school. An open question is whether after-school soda consumption might compensate for in-school reductions. However, the potential goal for policies would be to limit the availability of substitution between soda and other high-calorie drinks—perhaps policies can interactively work together to both shift students away from soda through the price mechanism and also limit availability of other substitutes. Although on its own, the prospects of soda taxation contributing to substantial reductions in obesity seem limited, more comprehensive policies may serve to affect the change in obesity rates that proponents desire. For example, Massachusetts recently passed new school standards that ban foods with artificial sweeteners, trans-fats, and caffeine from schools’ a la carte lines, vending machines, stores, events, and fundraisers. The standards also require schools to offer unsweetened fruits and vegetables, and provide water for free at all times (Kaiser 2011).

Finally, although new soda taxation may fail to meet its primary stated purpose of reducing obesity, it may yet enhance population health. Because soda consumption is typically “empty calories” with little nutritional value and it also reduces dental health, policies such as soda taxation, which have been shown to reduce soda consumption, may still be an effective health policy without actually contributing to its main goal of obesity reduction.

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Jason Fletcher (jason.fletcher@yale.edu) is an Associate Professor in Yale University's School of Public Health, Division of Health Policy and Administration, New Haven, Connecticut., as well as a Health and Society Scholar for the Robert Wood Johnson Foundation at Columbia University, New York, N.Y.

The views expressed are those of the authors and do not necessarily reflect the positions of the Federal Reserve Bank of Kansas City, the Federal Reserve System, or Purdue University.

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BETTER MILK THAN COLA: SOFT DRINK TAXES AND SUBSTITUTION EFFECTS

Carlisle Ford Runge, Justin Johnson, and Carlisle Piehl Runge

JEL Classifications: H, H2, H25

Keywords: Soft Drink Taxes; Obesity; Substitution effects

This article is part of a series of Policy Issues articles on Soda Tax. You can also find articles on [Should Soft Drinks be Taxed More Heavily?](#), [Can Taxing Sugary Soda Influence Consumption and Avoid Unanticipated Consequences?](#), [Sugar-Sweetened Beverage Taxation as Public Health Policy-Lesson from Tobacco](#), [Soda Taxes and Substitution Effects: Will Obesity be Affected?](#), [Evaluating Excise Taxes: The Need to Consider Brand Advertising](#), and [Caloric Sweetened Beverage Taxes: The Good/Food/Bad Food Trap](#) as part of this theme.

Soft drink excise taxes and the effect they may have on adolescent weight outcomes have come into focus as a potential policy option to address the obesity epidemic, which is increasingly recognized as a major contributor to health care spending and mortality and morbidity (Bhattacharya and Sood, 2011). U.S. sugar-sweetened sodas account for one-half of the increase in caloric consumption over the past 25 years, and are the largest source of added sugars in the average diet (Woodward-Lopez, Kao, and Ritchie, 2010). Barry M. Popkin, at the University of North Carolina's School of Public Health, has advocated aggressive policy interventions to reduce consumption of sweetened sodas to address the obesity crisis (Popkin, et al., 2006).

Recent econometric evidence suggests that increasing soft drink taxes will cause substitutions toward other beverages, although there is not agreement about the net health effects these policies will have. We offer a perspective on the economic and public policy interpretations of soda taxes that suggests a greater potential for reducing obesity and improving health. To assess the full effect of such policy options, economic theory and econometric evidence must be considered in the context of nutritional and metabolic effects.

Substitution Effects and Caloric Intake

At a theoretical level, assessing sin taxes on consumption goods that are likely to be consumed at unhealthy levels has been carefully considered. O'Donoghue and Rabin (2006) show that such taxes can improve social welfare, counteract over-consumption by consumers who cannot restrain their behavior effectively, and even result in outcomes where no one is made worse off. However, they warn that when goods such as soda are taxed, policymakers should not ignore the substitution of other, non-taxed goods.

Econometric analysis of these substitution effects (Fletcher, Frisvold, and Tefft, 2010) supports the claim that soft drink taxes would 1) raise revenues; 2) modestly reduce the amount of soda calories consumed; 3) induce the substitution of juice and whole milk for soft drinks; and (4) reduce caffeine consumption. Notably, they concluded that a change in the soft drink tax rate induces youths to substitute whole milk for soft drinks and, because "the magnitude of these effects is similar, it is not likely that an increase in soft drink taxes would decrease obesity" (p. 7). Specifically, using data from the National Center for Health Statistics of the CDC from 1989 to 2006, they found that a 1% tax on youth consumption of soft drinks reduces soda consumption by 6 calories, about 5% of average soda calories consumed daily. However, if such a tax rose to 16%, calories from soda were predicted to fall by 100 per day. This would be sufficient, according to Hill, et al. (2003), to prevent weight gain in over 90% of the population—but only if it was not offset by substitute caloric intake. Yet such substitutions are likely, with small increases in juice and larger increases in whole milk. In the Fletcher, et al. study, a 1% increase in soft drink taxes induces an 8-calorie increase in whole milk consumption per day. A 12 oz. can of soda contains 140 calories, but 12 oz. of whole milk contains 219 calories. This substitution results in slight increases in vitamin D consumption from milk and slight decreases in caffeine consumption.

Public Policy Implications

Even if the substitution of juice and milk does not reduce caloric intake as a result of a soda tax, there is a different perspective on the economic interpretation of the findings on substitution effects and their implications for public policy. One thing is clear: such taxes will dampen soda consumption. A 2010 study by USDA concluded that a tax-induced 20% price increase on sweetened beverages would reduce consumption by 37 calories a day, or 3.8 pounds of body weight over a year for adults, and by 43 calories a day, or 4.5 pounds a year for children. The result would be an estimated decline in overweight prevalence from 66.9% to 62.4% and obesity prevalence from 33.4% to 30.4% in adults. In children, overweight prevalence would fall from 16.6% to 13.7%, and the risk of being overweight would fall from 32.3% to 27.0% (Smith, Lin, and Lee, 2010). The decline in demand for soda in response to such a tax is reinforced by three other studies (Block, et al., 2010; Brownell, et al., 2009; and Power and Chaloupka, 2009). Soda taxes alone would then represent progress in reducing consumption of products that are a major cause of weight gain (Malik, Schulze, and Hu, 2006; and Vartanian, Schwartz, and Brownell, 2007). As a recent and comprehensive review by the Public Health Law Center at the William Mitchell College of Law concluded: "While reducing the consumption of these beverages will not single-handedly halt the obesity epidemic in the United States, growing evidence supports the use of pricing policies on sugar drinks as one of the most significant components of a comprehensive effort to reduce the prevalence of obesity and unhealthy weight" (Marrow, 2011, p. 20).

There are also reasons why milk-substitution responses, in particular, offer substantial improvements over the status quo and may actually assist in reducing obesity. First, milk consumption in lieu of soft drinks offers clear nutritional advantages, especially in children and young adults. Second, calories alone do not capture the metabolic effects of soft drinks, which are deemed by some experts to promote obesity, hypertension and Type II diabetes in ways that milk does not (Malik, et al., 2010). Third, nearly all of the milk consumed in schools is now 2%, 1% or skim, with fewer calories and less fat than whole milk. Fourth, levels of satiation are lower for milk than soda, so that children and teenagers will become full at lower amounts.

Milk's nutritional value is high; it contains proteins, minerals—Ca, P, Mg, Na, Zn, Cl, Fe and Cu, among others—and vitamins A, C and D. Humans have coevolved with bovine species to digest it—apart from the lactose intolerant—over thousands of years. By contrast, soda is devoid of protein, vitamins and minerals—apart from salt (Na): the average 12 oz. soft drink contains 50 grams (Robus, 2010). Although soda drinks have been with us for only about 100 years, it is notable that 30 years ago, U.S. middle and high school students consumed twice as much milk as soda; now, the ratio is reversed: students consume twice as much soda as milk (Cavadini, Siega-Riz, and Popkin, 2000).

Calories alone do not fully capture the metabolic effects of soft drinks. Fructose-laden soft drinks are digested similarly to alcohol and converted to fat by the liver, increasing triglycerides in the bloodstream. They also reduce the production of leptin, which normally signals the body to reduce caloric intake and increase energy output. They increase the dopamine reward response, making soda drinkers hungrier, while increasing cortisol release, lowering insulin resistance (Mietus-Snyder and Lustig, 2008; and Wylie-Rosett, Segal-Isaacson, and Segal-Isaacson, 2004). The University of California-San Francisco Center for Obesity sends obese children and their parents home with the admonition: "drink only water and milk." As milk consumption has given way to soda, Vitamin D consumption has fallen together with calcium. In addition, phosphoric acid in sodas appears to interfere with calcium absorption and contributed to a three-fold increase in bone fractures in samples of soda-drinking teens (Wyshak, 2000).

Federal law—Section 202 of the 2010 Healthy, Hunger-Free Kids Act—requires that schools offer a variety of fluid milk products consistent with dietary guidelines including the 2007 Institute of Medicine standards for food in schools, recommending unflavored non-fat and low-fat milk. This means that whole milk, the main basis of claims that its substitution will not reduce obesity, is no longer served in most schools. Although chocolate and other flavored milks are often dosed with fructose, plain milk in schools is generally 2%, 1% or skim. Although a 12 oz. serving of whole milk contains about 220 calories, 2% has 183 calories, 1% has 153 calories and skim milk has 135 calories. Substituting reduced-fat milk for soda retains nearly all of the nutritional value of milk while reducing its lipid triglycerides.

Finally, fructose-sweetened soft drinks do not trigger a pituitary satiety—ghrelin—response; they actually do the opposite (Lustig, 2009). Milk, by contrast, appears to have a built-in satiety brake. Its digestion occurs when acids cause it to curdle in the stomach (University of Guelph, 2010). Lactose—milk sugar—must be processed with the enzyme lactase, which even in lactose-tolerant people is available only in sufficient quantity to digest about one or two glasses of milk over several hours. The calcium in milk is neutralized by stomach acids during curdling, but the main brake on milk consumption is that a 12 oz. glass of milk contains 450 mg of calcium. Shahar, et al. (2010) report that higher intakes of dairy calcium and vitamin D are actually related to greater diet-induced weight loss. Dove, et al.

(2009) report that skim milk leads to greater perceptions of satiety and fewer calories consumed at the next meal compared with fruit drinks. In the latest and most comprehensive assessment of 120,877 participants in the Nurses Health Study, Nurses Health Study II and Health Professionals Study, over a 12- to 13-year period, increases in dairy product intake had a neutral effect on weight (Mozaffarian, et al., 2011).

Excise Taxes Appear to Be Good Policy

Taxing soda will reduce its consumption and raise revenue; by one recent estimate a 1 cent/oz. national U.S. excise tax would cut soda calorie consumption 8-10% and raise \$15 billion per year (Brownell, et al., 2009). Moreover, from a theoretical perspective, the cross-subsidization from non-consumers of soft drinks to consumers resulting from such a tax is not large, and both classes of consumers can be shown to be better off (O'Donoghue and Rabin, 2006). Even if the caloric reduction in soft drinks is offset by whole milk consumption, the nutritional and metabolic advantages of milk versus soda are clear. If such consumption is of plain, reduced-fat milk, these advantages are amplified. Finally, a 1-for-1 substitution of milk for soda on a per volume basis is unlikely, due to milk's digestibility relative to soda. For these reasons, wide adoption of such excise taxes appears to be good policy. Even if they fail to reduce caloric intake in young people, the quality of those calories will improve.

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Carlisle Ford Runge (frunge@umn.edu) is Distinguished McKnight University Professor of Applied Economics and Law, Department of Applied Economics, University of Minnesota. Justin Johnson (joh07536@umn.edu) is a Graduate Research Fellow, Department of Applied Economics, University of Minnesota. Carlisle Piehl Runge (carlisle.runge@yale.edu) is a student in Davenport College, Yale University.

The views expressed are those of the authors and do not necessarily reflect the positions of the Federal Reserve Bank of Kansas City, the Federal Reserve System, or Purdue University.

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EVALUATING EXCISE TAXES: THE NEED TO CONSIDER BRAND ADVERTISING

Joshua Berning

JEL Classifications: M35, M38

Keywords: Brand Advertising, Advertising Effects, Excise Taxes

This article is part of a series of Policy Issues articles on Soda Tax. You can also find articles on [Should Soft Drinks be Taxed More Heavily?](#), [Can Taxing Sugary Soda Influence Consumption and Avoid Unanticipated Consequences?](#), [Sugar-Sweetened Beverage Taxation as Public Health Policy-Lesson from Tobacco](#), [Soda Taxes and Substitution Effects: Will Obesity be Affected?](#), [Better Milk than Cola: Soft Drink Taxes and Substitution Effects](#), and [Caloric Sweetened Beverage Taxes: The Good/Food/Bad Food Trap](#) as part of this theme.

As city, state and the federal governments consider excise taxes on carbonated soft drinks (CSDs) or sugar-sweetened beverages (SSBs) there has been extensive discussion in academia and by public interest groups regarding the efficacy of such policy. The discussion has focused primarily on two issues: what would be the effect of excise taxes on consumption and ultimately obesity; and would these taxes be equitable—or, to what extent would they be regressive? To date, there have been numerous studies that examine the demand for CSDs or SSBs. Although there is variation in demand estimates depending on the level of aggregation—product versus brand—and market definition—which products to include, the results suggest that such excise taxes, if passed on to consumers, would lower consumption and generate revenue. However, the taxes would likely be regressive. Smith et al. (2010) provide a thorough discussion of the issue and the various economic implications of taxes on CSDs or SSBs.

Missing from the discussion and analyses of excise taxes, however, is the consideration of other marketing mix variables, particularly advertising. Although price effects are of obvious importance, advertising plays a significant role in affecting consumer behavior, including consumer price response. As such, advertising of CSDs and SSBs will impact the outcome of excise tax policies. Failing to consider the role of product advertising, especially in markets that rely so heavily on horizontal differentiation across subjective characteristics, leads to an incomplete understanding of the implications of excise taxes.

Pervasiveness of advertising and brand identity

Given the number and variety of CSDs and SSBs, horizontal product differentiation can be essential to competing firms (Bagwell, 2007). Consequently, CSD and SSB firms spend significant amounts of money on television advertising alone. Although there are other forms of advertising, this article focuses on television advertising which has the highest expenditures and is most prominent. Table 1 shows a list of major CSD and SSB brands and their television advertising expenditures for 2009 (Kantar Media, 2009). The Coca-Cola Company spent over \$60 million on their flagship product Coca-Cola Classic, PepsiCo spent over \$20 million on Pepsi and Dr. Pepper-Snapple spent over \$20 million on Dr. Pepper. Even Gatorade, a sports drink, spent over \$30 million on television advertising for various products. Further, the majority of expenditures were for network advertising which reaches a larger audience.

Table 1**Carbonated Soft Drink and Sugar Sweetened Beverage Television Advertising, 2009 (\$'000's)**

Brand	Network	Spot	Syndication	Cable	Total
Coca-Cola Classic Soft Drink	\$18,820	\$987	\$3,300	\$7,709	\$60,816
Sprite Soft Drink	\$2,396	\$118		\$4,984	\$7,498
Pepsi Soft Drink	\$17,332	\$33		\$3,206	\$20,570
Mountain Dew Soft Drink	\$808	\$98		\$128	\$1,034
Dr Pepper Cherry Soft Drink	\$9,479	\$161	\$3	\$5,095	\$14,738
Dr Pepper Soft Drink	\$13,404	\$1,905	\$16	\$6,176	\$21,501
A & W Root Beer Soft Drink		\$24		\$4,990	\$5,015
Gatorade Tiger	\$5,164	\$279	\$1,895	\$2,077	\$9,414
Gatorade G2	\$9,074	\$13	\$1,899	\$3,946	\$14,932
Gatorade Various RTS Sports Drink	\$19,804	\$1,068	\$4,632	\$8,419	\$33,923
Gatorade RTS Beverage	\$21,661	\$702	\$4,595	\$6,651	\$33,609
Kool-Aid Presweetened Fruit Drink Mix	\$1,238	\$15	\$295	\$1,664	\$3,212
Kool-Aid Presweetened & Unsweetened Fruit Drink Mix	\$3,320	\$54	\$1,211	\$5,630	\$10,215

SOURCE: Kantar Media, 2009

CSD and SSB firms generally employ a pulsing advertising strategy which involves high-frequency, year-round television advertising. Contrast this with one-time only or continuous advertising campaigns. Pulsing advertising has been shown to be more effective at generating more advertising exposure for lower costs (Dube, Hitsch, and Manchanda, 2005). As such, consumers are steadily exposed to CSD and SSB television advertising.

A common metric used to evaluate advertising is Gross Ratings Points (GRPs), which measure the percentage of audience reached by an advertisement times the frequency of the advertisement. Figure 1 plots weekly television GRPs for all Coca-Cola products from 2006-2008 for children under 12 and for adults. The steady stream of pulse advertising is apparent, with the summer months experiencing more frequency and the winter (February 2006) and summer (August 2008) Olympics having large spikes. Interestingly, Coca-Cola does not directly advertise to child-dominated audiences, according to their advertising pledge (Better Business Bureau, 2011). Yet the GRPs for children are persistent and tend to follow adult GRP trends. Clearly, CSD brand advertising is pervasive and is viewed by broad audiences, not just those who are directly targeted.

Television brand advertising has also been shown to create long-term brand identity as well. McClure et al. (2004) examined how Coke and Pepsi affected brain activity of volunteer subjects during a taste test. They found that tasting each soft drink activated reward areas of subjects' brains that are associated with pleasure and satisfaction. More importantly, when participants were told they were drinking Coke, not only did the reward areas become active, but the memory regions of the brain as well. According to the researchers, "[Their study] showed that the brand alone has value in the brain system above and beyond the desire for the content of the can." (Park, 2007). The effect of excise taxes on consumption will be influenced by such powerful brand identity.

Effect of Advertising on Demand

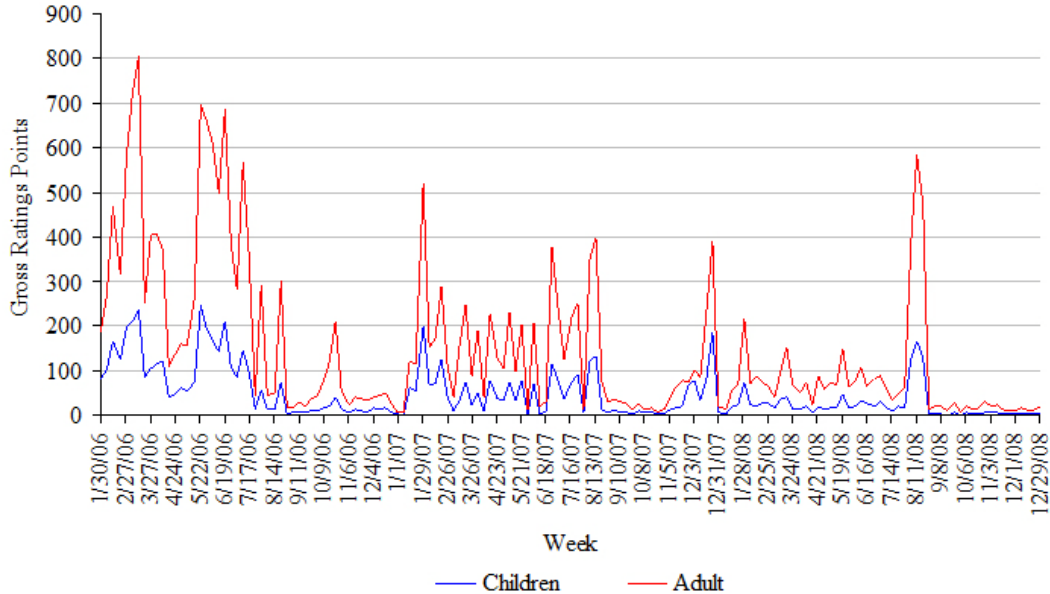
With such strong advertising efforts and the brand loyalty it creates, advertising of CSDs and SSBs can have a significant impact on the effectiveness of excise taxes. Obviously, many studies do not include advertising due to a lack of data. An important question, then, is what impact does the omission of advertising variables have on analyses of excise taxes?

Price Elasticity

Omitting advertising from empirical demand analyses will affect estimates of demand elasticity—the percentage change in quantity demanded corresponding to a percentage change in price—as advertising both shifts and rotates demand depending on the type of advertising (Johnson and Myatt, 2006). Erdem, Keane and Sun

(2008) find that for 17 of 18 product lines, television advertising rotates demand counterclockwise—increasing demand elasticity—suggesting that advertising increases the number of consumers willing to pay for a particular product. The one exception where demand rotated clockwise, they suggest, was due to the industry having a few number of firms and greater emphasis on horizontal differentiation. Focusing explicitly on soft drink advertising, Zheng, Kinnucan, and Kaiser (2010) find that television advertising rotates the demand curve for soft drinks counterclockwise. The authors suggest that such advertising has its greatest appeal among consumers with low WTP for soft drinks.

Figure 1: Coca-Cola Television Gross Ratings Points for Children and Adults, 2006-2008



While the above-mentioned studies find advertising makes demand estimates more elastic, others find the opposite effect. Krishnamurthi and Raj (1985) find that brand-level demand estimates are significantly more inelastic as advertising is increased. In an extensive evaluation of numerous product lines, Ataman, Van Heerde and Mela (2010) also find that, in general, television advertising makes products more inelastic.

Based on the existing literature, it is apparent that elasticity estimates that do not account for advertising will be biased. Consequently, so will the estimated impact of excise taxes. Further, it appears that the direction of the bias due to omitting advertising is unclear and should be determined by empirical analysis. Advertising for CSDs and SSBs may make the demand curve more elastic while also increasing demand if it recruits marginal consumers to begin consuming. Alternatively, since a few CSD firms have significant market share, advertising may be used for horizontal product differentiation and therefore make consumers more price insensitive.

It is possible to mitigate biased price estimates using existing econometric techniques such as instrumental variables which rely on replacing the price variables with acceptable substitute variables. There are two important shortcomings, however. First, from an econometric perspective, it can be difficult to find appropriate substitutes for prices. More importantly, instrumental variables estimates do not provide the same information as estimates of advertising and advertising-price interactions. That is, they do not answer what direct effect advertising has on demand and to what extent advertising impacts price effects.

Tax Regressivity

Advertising may have varying effects on different household types. The extent of the regressivity of excise taxes may be lessened or exacerbated by product advertising. If advertising makes demand more inelastic for low income households, then excise taxes will be even more regressive than previously estimated. Alternatively, if higher income households are more sensitive to advertising, then excise taxes may be less regressive. Therefore, the heterogeneous effect of advertising across households should be considered to fully understand the burden of excise taxes.

Other Advertising Effects

Advertising not only affects price estimates, it also directly impacts demand for CSDs and SSBs (Zheng and Kaiser, 2008). While excise taxes target CSD and SSB prices, excise taxes have no direct impact on advertising. Firms may change their advertising or marketing strategies following the implementation of excise taxes. For example, CSD and

SSB firms could increase their advertising efforts to offset any price changes resulting from excise taxes. It is important to understand the extent that advertising effects may compete with price effects.

Another issue to consider is that advertising can impact substitution patterns between products which are an important consideration when examining excise taxes, as consumers switch from one product to another (Fletcher et al. 2010). For example, Zheng and Kaiser (2008) find that advertising for soft drinks has a spillover effect on other beverage categories which impacts the degree of product substitution. Failing to account for how advertising affects switching behavior will misrepresent the impact of excise taxes on overall consumption.

Opportunities

There are also opportunities to use advertising to promote healthful alternatives. Previous literature on information campaigns finds that promoting healthful consumption has been shown to have an affect on consumer choices. For example, the 5-a-day campaign promoting consumption of fruits and vegetables is shown to increase consumption across numerous countries (Pomerleau et al., 2005; Capacci and Mazzocchi, 2011). Information campaigns are generally delivered using educational materials or other non-commercial media and venues (Pomerleau et al., 2005). Television advertising has the ability to reach a much larger audience than information campaigns. Promoting healthy foods using television advertising could enhance the effect of excise taxes by increasing substitution to more healthful alternatives.

There may be benefits from reducing or restricting advertising as well. The Children's Food and Beverage Advertising Initiative (CFBAI) is a voluntary, industry lead program currently comprised of 17 large food and beverage companies who have volunteered to restrict advertising of unhealthful foods to children. The Interagency Working Group on Food Marketed to Children is a similar government lead initiative currently in development. Although there is no evidence of any short-term effect of restricting advertising to children, there may be long-term benefits to such efforts.

Concluding Comments

In the continuing discussion of excise taxes on CSDs and SSBs, it is important to understand what revenues will be generated by the taxes, who will bear the burden of the taxes and what effect, if any, they will have on consumption or obesity. Brand advertising has a clear effect on both consumption and consumer perceptions of brand identity. Given the high level of CSD and SSB advertising, it is essential to understand how advertising affects consumer demand for CSDs and SSBs.

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Joshua P. Berning (Joshua.Berning@UConn.edu), is Assistant Professor in the Department of Agricultural and Resource Economics, University of Connecticut, Storrs, Connecticut.

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CALORIC SWEETENED BEVERAGE TAXES: THE GOOD FOOD/BAD FOOD TRAP

Robbin S. Johnson

JEL Classifications: H, H2, H25

Keywords: Beverage Taxes, Obesity Prevention, Public Health Strategies

This article is part of a series of Policy Issues articles on Soda Tax. You can also find articles on [Should Soft Drinks be Taxed More Heavily?](#), [Can Taxing Sugary Soda Influence Consumption and Avoid Unanticipated Consequences?](#), [Sugar-Sweetened Beverage Taxation as Public Health Policy-Lesson from Tobacco](#), [Soda Taxes and Substitution Effects: Will Obesity be Affected?](#), [Better Milk than Cola: Soft Drink Taxes and Substitution Effects](#), and [Evaluating Excise Taxes: The Need to Consider Brand Advertising](#) as part of this theme.

Obesity has become so prevalent and its correlation with a broad set of chronic diseases so compelling that few would argue society should do nothing about it. The policy debate is not about whether to act but about what to do. This article contrasts the recommendation to tax one class of food—caloric-sweetened beverages—with a more comprehensive strategy.

Public and Private Health Recommendations

The National Heart Lung and Blood Institute provides a summary of what the public health community sees as the recommended steps for preventing overweight and obesity: “A lack of energy balance most often causes overweight and obesity.... Overweight and obesity happen over time when you take in more calories than you use.”

The National Institutes of Health (NIH) also catalogues the many factors that contribute to overweight and obesity; they include: spending too much time sitting down watching screens; a physical environment that promotes vehicle use rather than walking; competition for the dining-out dollar that leads to larger portion size; lack of access to healthy foods or individualized portions; advertising messages promoting processed, calorie-dense foods; genetic factors; hormonal or other metabolic causes; use of medicines that contribute to weight gain; emotional needs that encourage overeating; quitting smoking; sleeping too little or too much; and aging.

Given this complex array of contributing factors across diet, lifestyle, personal makeup and surrounding environment, it is not surprising that NIH focuses its recommendations for preventing overweight and obesity on learning a number of healthy behaviors: make following healthy lifestyle a family goal, including following a healthy eating plan; focusing on portion size; remaining active; reducing screen time; and keeping track of weight, body mass index, and waist circumference.

This public health strategy essentially has three components: balancing calories in with calories out; choosing the right foods in the right portions, and taking responsibility for good health outcomes for one’s self and any dependents. Balance, choice and responsibility taken together represent a strategy that fits the complexity and scale of the overweight and obesity problem. The Mayo Clinic concurs: “Whether you’re at risk of becoming obese, currently overweight or at a healthy weight, you can take steps to prevent unhealthy weight gain and related health problems. Not surprisingly, the steps to prevent weight gain are the same as the steps to lose weight: daily exercise, a healthy diet, and a long-term commitment to watch what you eat and drink.”

Given the broadly-based nature of the causes of overweight and obesity, the public and private health strategies recommended by experts address the multiple causes of weight gain and place the onus for change on individuals. Is the idea of taxing sweetened soda beverage a useful element in a strategy for combating overweight and obesity?

On balance, it does not seem to be, for several reasons. First, it oversimplifies the problem by focusing on only one of many dietary inputs and ignoring the output side of the caloric equation. Second, it fails to address the many tax “loopholes” left behind—including substitution of other caloric-sweetened foods for the missed calories, consumption of other calorie-dense foods driving the weight-gain-train and rising tolerance over time for higher-priced sweetened soda. Third, it ignores its own collateral damage, including the regressive incidence of the tax on low-income people and the burden unnecessarily placed on responsible consumers of sweetened soda. Finally, it does not lead to better understanding of the problem and individual accountability.

Correlation, Not Causation

Advocacy of a soda tax starts with a “link” between rising consumption of caloric-sweetened beverages and overweight and obesity. But the advocates of this approach gloss over the nature, tightness or relevance of that linkage to its taxing strategy. As to the nature of the linkage, unlike smoking, which is hazardous to one’s health under any circumstances, caloric-sweetened beverages are not intrinsically hazardous or even problematic. “Taken as directed,” they can be pleasurable, a quick source of energy, a nice meal complement or a break from the tedium of the day. It is when sweetened soda is consumed excessively that it begins to contribute to overweight and obesity. As with so many of life’s choices, it is the dosage that matters.

As to the tightness of the linkage, a recent longitudinal study of weight gain in both men and women published in the *New England Journal of Medicine* found:

“On the basis of increased daily servings of individual dietary components, 4-year weight change was most strongly associated with the intake of potato chips—1.69 lb., potatoes—1.28 lb., sugar-sweetened beverages—1.00 lb., unprocessed red meats—0.95 lb., and processed meats—0.93 lb. . . .” (Mozaffarian, et al., 2011).

While increased consumption of soda is a contributor to long-term weight gain, it was not the leading contributor. Ironically, it looks like increased consumption of meat and potatoes accounts for much more of the gain. One can always take too much of a good thing, including mom’s old prescription to “eat your meat and potatoes” for good health.

More importantly, it is only increases in consumption that had the measured effects. Portion control is also vital to maintaining a healthy weight. Finally, more alcohol—0.41 lb. per drink per day—more TV—0.31 lb. per hour per day—and less sleep—other prominent characteristics of modern lifestyles—also contribute to weight gain (Mozaffarian, et al., 2011). A healthy, stable weight comes from the many factors that make up a healthy behavior pattern.

As to the relevance of the linkage, the whole idea of taxing a food puts the emphasis in the wrong place. Behavior, not a bad food, should be the fulcrum of obesity prevention. Taxing soda is like taking away one sweet while ignoring other sweets and calorie-dense foods, oversized portions, inactive lifestyles and other contributing factors to obesity. In fact, if one were to use taxes to combat overweight and obesity, it would probably make more sense to tax the outcome rather than a single input.

Substitution Effects

While a soda tax may reduce consumption of sweetened beverages it may nevertheless fail to reduce overall caloric intake. People will likely substitute other sweetened foods. The gap also may be filled by increased consumption of other calorie-dense foods. Either substitution would frustrate the purpose of the soda tax.

Most studies of the effectiveness of soda taxes assume away this substitution effect. Still, they arrive at tax rates that have to be quite high in order to produce estimated modest dents in the incidence of obesity. Or, as a reviewer of sugar-sweetened soft drink (SSD) and obesity studies concluded, “Assertions that SSD are a disproportionate cause of excess body weight and/or that their avoidance would be effective in preventing weight gain are, in my opinion, not well substantiated by the science,” (Gibson, 2008).

Even harder to estimate is the degree to which people will build up indifference to the tax over time and what effect this tolerance for paying the tax would have on consumption. The history of other “sin” taxes, like those on cigarettes and alcoholic beverages, suggests that consumers adjust to the higher cost and resume or maintain their consumption. The real progress in reducing smoking came not from taxes but from health warnings on packages and

from advertising, education campaigns and “clean indoor air acts”—i.e., policies that aim at changing behaviors, not price relationships.

Collateral Damage

Advocates of soda taxes are wont to minimize or dismiss the welfare effects of their proposal. The incidence of such a tax, however, is strongly regressive. It is not just that low-income families are likely to pay a significant share of the total of such revenue. Such a tax also will consume a larger share of poor peoples' disposable incomes and leave them with even less to spend on healthier foods like fresh fruits and vegetables. Advocates of such a tax also tend to gloss over the difference between causation and correlation. Cigarette smoking causes cancer and other cardiovascular diseases. There is no good or safe dosage of smoking. There even is harm to others caused by second-hand smoke. This is an entirely different linkage than exists between soda consumption and obesity. Caloric-sweetened beverages are safe and enjoyable for many to consume. A tax on them unjustly burdens a portion of the population not deserving of being targeted. This is fundamentally different from taxing cigarettes, where all smokers are fairly taxed.

Understanding and Accountability

Finally, there is nothing about a soda tax per se that contributes to the growth in understanding that would lead most directly to the kind of behavior change needed to arrest and reverse obesity. As a backhanded recognition of this fact, advocates of a soda pop tax will sometimes argue that the revenues raised can be used to fund such educational initiatives.

Two problems arise from such an argument. The first is the practicality of earmarking such revenues for these purposes. The tobacco settlement payments are instructive. Most states have pulled them directly into general revenues or tapped them for budget-balancing shenanigans—as recently done in Minnesota. In a world where “no new taxes” clashes with deficit reduction necessities, neither passage of such a tax nor earmarking it for a broader public health initiative seems likely.

The second problem is even simpler: if such spending legerdemain could in fact be achieved, then why not fund it with a fairer tax? It is, after all, the personal accountability that better understanding and education seek to achieve that will make the real difference in curbing obesity.

All of which brings the discussion back to a more open-ended quest for good health policy with respect to the increase in obesity here and abroad. The foundation for such a policy should not be a soda tax, which only leads to the good food/bad food trap of treating symptoms, not causes. The causes of overweight and obesity are rooted in environmental, behavioral and cultural factors that make obesity easier to come by than to avoid. A narrowly targeted tax leaves most of these factors unaddressed. It is likely to end up misdirected, ineffective, inequitable and unfairly punitive for some.

Changing behavior works best when anchored in good science and broad-based education. The appropriate policy application to rising obesity requires balance, choice and responsibility. Balance calories in with calories out through diet and activity. Make good choices in the quality and quantity of foods consumed. And take responsibility for one's lifestyle. This kind of approach is more likely to work.

It also is more likely to make an ally rather than an adversary of the beverage industry. When that happens, progress often comes more quickly and easily. For example, the Alliance for a Healthier Generation—an initiative of President Clinton's foundation—is working with the beverage industry to change what is offered in school cafeterias. Among the 8,000 schools participating by 2009, it had achieved “a 65% decrease in full calorie soda shipments to schools...and 79% of school districts in compliance with alliance standards,” (Milling and Baking News, 2009). This also is the approach being taken by First Lady Michelle Obama, who is working with food retailers to give poor people better access to grocery stores selling more healthful foods.

A good example of the collaboration potential around an educational rather than a taxation approach is the recently announced 2010 Dietary Guidelines for Americans and its “MyPlate” symbol. “More than 2,000 organizations have joined the Nutrition Communicators Network, which launched June 2 coincident with the unveiling of the MyPlate icon.... Partners include public and private businesses as well as non-profit organizations that represent a diverse cross-section of stakeholders and partners,” (Food Business News, 2011).

Concluding Comments

Teaching all Americans to eat and live healthier lives rests on the principles of balance, choice and responsibility rather than taxes. That approach pushes a solution that better conforms to the problem. It also fits the idea that collaboration and common ground can work where confrontation and battle grounds often do not.

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Robbin Johnson (rjohnson3526@aol.com), is currently a teaching fellow in the Hubert H. Humphrey Institute of Public Affairs, University of Minnesota; Minneapolis, Minnesota and formerly Senior Vice President for Public Affairs, Cargill, Inc.

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