Taxes on Sugar-Sweetened Beverages:
A Policy Failure

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Since 2014, eight U.S. cities have implemented sugar-sweetened beverage (SSB) taxes. Several other cities and states are contemplating similar measures. SSB taxes are intended to curb sugar consumption and improve public health, but policymakers too often ignore the unintended consequences these measures provoke. This ConsumerGram examines the effects of SSB taxes, including their disproportionate impact on poor households, their failure to meaningfully shift consumers behaviors, and their negative economic effects on local communities.

Introduction

The debate that Americans, as a whole, consume too much sugar has received much attention recently.[1] Research shows that diets high in added sugar contribute to obesity, heart disease, diabetes, and a host of other chronic conditions.[2] To address these public health concerns, some policymakers have embraced targeted "sin" taxes on sugar-sweetened beverages (SSBs).

In 2014, Berkeley, California became the first jurisdiction in the nation to pass an SSB tax. In the years since, several more U.S. cities -- including Seattle, Philadelphia, and San

[1] Miller, Paige E., Robin A. McKinnon, Susan M. Krebs-Smith, Amy F. Subar, Jamie Chriqui, Lisa Kahle and Jill Reedy, "Sugar-sweetened beverage consumption in the US: novel assessment methodology," *American Journal of Preventive Medicine,* Vol. 45:4, 2013, pp. 416-421.

[2] *See James J.* DiNicolantonio, Sean C. Lucan and James H. O'Keefe, "The evidence for saturated fat and for sugar related to coronary heart disease, " Progress in cardiovascular diseases, Vol. 58:5, 2016, pp. 464-472; and Vasanti S. Malik and Frank B. Hu, "Sugar-sweetened beverages and cardiometabolic health: an update of the evidence," *Nutrients*, Vol. 11:8, 2019, p. 1840.

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Francisco -- have followed suit, implementing taxes on a variety of SSBs, including sodas, sports drinks, fruit drinks, chocolate milk, sweetened teas and coffees, and other beverages with caloric sweeteners.

The argument in favor of SSB taxation is as follows: the sugar-sweetened products are linked to preventable diseases which reduce quality of life, generate high medical costs, and impose negative externalities on others. To address this issue, policymakers seek to reduce consumption and encourage healthier habits by raising the price of SSBs.

Yet, the real-world impact of these taxes paints a starkly different picture that is not as simplistic as policymakers are perceiving it.

Do SSB Taxes Improve Public Health?

The primary goal of SSB taxes is to reduce caloric intake and encourage healthier eating habits.[3] As more jurisdictions in the U.S. and abroad have adopted SSB taxes, researchers have been able to analyze increasingly detailed datasets to investigate people's dietary responses to SSB taxes. While findings remain inconclusive due mainly to the variation in types of data analyzed and the different econometric methods used, studies consistently find little or no change in caloric consumption caused by SSB taxes.

A study conducted by the New Zealand Ministry of Health in 2017 that reviewed the literature found that "studies using sound methods report reductions in [sugar] intake that are likely too small to generate health benefits and could easily be canceled out by substitution of other sources of sugar or calories." The report added: "No study based on actual experience with sugar taxes has identified an impact on health outcomes."[4]

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[3] John Cawley, Anne Marie Thow, Katherine Wen and David Frisvold, "The Economics of Taxes on Sugar-Sweetened Beverages: A Review of the Effects on Prices, Sales, Cross-Border Shopping, and Consumption," *Annual review of nutrition*, Vol. 39, 2019, pp. 317-338.

[4] "Sugar taxes: A review of the evidence," New Zealand Institute of Economic Research, August 2017, https://nzier.org.nz/static/media/filer_public/f4/21/f421971a-27e8-4cb0-a8fc-95bc30ceda4e/sugar_tax_report.pdf.

The findings are corroborated by public health experts like Fatima Stanford, a professor at Harvard Medical School, who warns that SSB taxes won't deliver the reductions in obesity that some politicians are promising. "We have not seen any major shifts with regards to actual obesity rates with regards to putting sugar taxes here in the United States," Dr. Stanford said in 2019.[5]

In 2018, a study published by researchers at the Children's Nutrition Research Center at Baylor College of Medicine found that "the evidence supporting [a] relationship between SSB consumption and child body mass index (BMI) is consistently small and lacks causality." The authors went on to conclude that "the effects of policies are unclear; taxation has no clear relationship to SSB purchasing."[6]

A recent study by the National Bureau of Economic Research similarly examined the impact of SSB taxes. By looking at household receipt data in the four largest U.S. cities with such taxes -- Philadelphia, San Francisco, and Seattle -- the results suggest that an increase in the tax rate of 1 cent per ounce decreases household SSB purchases by 12.2 percent, reflecting a "reduction in individual consumption of 5 calories per day per household member and eventual reduction in weight of 0.5 pounds."[7] Moreover, this decline in consumption was concentrated in Philadelphia; no impacts were detected in the other three cities combined.

Studies that use theoretical modeling methods, rather than observational data, to estimate the effects of SSB taxes find relatively small shifts in consumer behaviors. For example, a 2013 paper projected that a 20 percent price increase on SSBs would result in an average decrease of 24.3 calories per person per day, resulting in weight loss of just 2.9 pounds over ten

[5] Stephanie Dalzell, "A sugar tax alone won't do much to combat obesity, experts say," Australian Broadcasting Corporation, June 13, 2019, https://www.abc.net.au/radio/programs/am/experts-doubt-the-effectiveness-of-sugar-tax-to-combat-obesity/11204808.

[6] Shabnam R. Momin and Alexis C. Wood, "Sugar-Sweetened Beverages and Child Health: Implications for Policy," *Current Nutrition Reports*, December 2018, Vol. 7: 4, pp. 286–293, https://link.springer.com/article/10.1007/s13668-018-0249-7.

[7] John Cawley, David Frisvold, and David Jones, "The Impact of Sugar-Sweetened Beverage Taxes on Purchases: Evidence from Four City-Level Taxes in the U.S.," Working Paper, National Bureau for Economic Research, October 2019, https://www.nber.org/papers/w26393.pdf.

years.[8] Research in the British Medical Journal in 2013 found significantly weaker effects; a 20 percent SSB tax was estimated to reduce consumption by only 4 calories per person per day, equivalent to one gram of sugar per day.[9]

Lessons from Abroad

Denmark

Denmark's experiences with its "fat tax" illustrate many of the unintended consequences of tax initiatives aimed at "nudging" consumers toward healthier diets. In October 2011, Denmark implemented a tax on saturated fats. The policy was abandoned a mere fifteen months later amid a fierce public backlash and disappointing results. The Institute for Economic Affairs, a British think tank, reports that "opinion polls showed that 80 per cent of Danes did not change their shopping habits at all as a result of the tax. The impact on the nation's waistline is therefore likely to have been approximately zero."[10]

Moreover, the tax spurred sharp increases in cross-border shopping as Danes went to Germany and Sweden to avoid the tax, causing the loss of an estimated 1,300 Danish jobs. A survey by DSK, for example, showed that 60 percent of Danish households had bought beer or soft drinks in Germany within the past year. By contrast, a few years before the tax was implemented, 60 percent of Danish households said in the same survey that they "never" traded at the German border.[11]

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[8] Eric A. Finkelstein, Chen Zhen, Marcel Bilger, et al., "Implications of a Sugar-Sweetened Beverage (SSB) Tax When Substitutions to Non-Beverage Items Are Considered," *Journal of Health Economics*, Vol. 32:1, January 2013, pages 219-239, https://www.sciencedirect.com/science/article/abs/pii/S016762961200166X.

[9] Adam D. M. Briggs, Oliver T. Mytton, Ariane Kehlbacher, et al., "Overall and Income Specific Effect on Prevalence of Overweight and Obesity of 20% Sugar Sweetened Drink Tax in UK: Econometric and Comparative Risk Assessment Modelling Study," *British Medical Journal*, 2013, https://www.bmj.com/content/347/bmj.f6189.

[10] Christopher Snowdon, "Denmark's fat tax disaster – the proof of the pudding," Institute of Economic Affairs, May 25, 2013, https://iea.org.uk/blog/denmark%E2percent80%99s-fat-tax-disaster-the-proof-of-the-pudding.

[11] Henriette Jacobsen, "Denmark scraps its infamous fat tax after only one year," EURACTIV, February 21, 2016, https://www.euractiv.com/section/agriculture-food/news/denmark-scraps-its-infamous-fat-tax-after-only-one-year/.

Mexico

Research on Mexico's sugar taxes that were adopted in 2014 reveals that the tax has reduced consumption of sugary drinks by less than seven calories per day, or about two-thousandths of the average Mexican's daily calorie intake.[12] Overall, SSB sales declined by a mere 3 percent.

According to official government data, 62 percent of the revenue collected from Mexico's sugar tax comes from the country's lowest income households.[13] For this segment of the population, spending on soft drinks represents 19 percent of their income (before government transfers), 39 times more than what the richest Mexicans spend.

Small businesses have suffered as well. Thirty thousand small Mexican grocers went out of business in the first half of 2016 alone and among those still open, 93 percent experienced a fall in profits.[14] A study by Autonomous University of Nuevo Leon's Center for Economic Research estimated the tax eliminated 10,800 jobs from the Mexican economy.[15] Overall, the two cases indicate that the expected effects of implementing a sugar tax were overly optimistic at best.

Local Economic Effects of SSB Taxes

Philadelphia's experiences highlight some of the local economic impacts associated with SSB taxes in the U.S. Although researchers have found that SSB sales declined in Philadelphia

[12] David Clement, "A soda tax is a bad idea, and we can prove it," *National Post*, May 28, 2019, https://nationalpost.com/opinion/a-soda-tax-is-a-bad-idea-and-we-can-prove-it.
[13] "Why the STPS to soft drinks is a bad idea?," ANPRAC (the National Association of Producers of Refreshments and Carbonated Water), July 2018, https://www.fooddrinktax.eu/wp-content/uploads/2018/07/IEPS_Why-the-STPS-to-soft-drinks-is-a-bad-idea_-1.pdf.
[14] Lisa Gable, Winona Roylance, and Michelle Guillermin, "Unintended Consequences: The Economic Impact of the Sugar Tax on Small Stores and Bakeries in Mexico," *Diplomatic Courier*, January 4, 2017, https://www.diplomaticourier.com/posts/unintended-consequences-economic-impact-sugar-tax-small-stores-bakeries-mexico.
[15] "Study: 10,800 jobs lost in Mexico due to sugary drink tax," EFE, February 10, 2016, https://www.efe.com/efe/english/business/study-10-800-jobs-lost-in-mexico-due-to-sugary-drink-tax/50000265-2835852.

after the tax's implementation in 2017, the drop in sales within the city was mostly offset by cross-border shopping into neighboring areas that don't levy the tax. The net reduction in sugary drinks consumption was insignificant, a study found.[16] "The health impact is mediocre at best," as emphasized by Dr. Song Yao, one of the paper's authors.[17]

As Philadelphians shift their shopping to the suburbs to avoid the soda tax, grocery stores within the city have seen sales of other products plummet. Revenue from soup, yogurt, frozen vegetables, cheese, and fresh bread all declined between 8 and 14 percent in Philadelphia in the months after the tax was imposed. Meanwhile, sales in neighboring communities increased sharply.[18] In 2017, supermarkets were losing an average of $80,000 a month from a reduction in beverage sales, but because customers were combining their purchases outside the city, the total loss attributable to the tax was $300,000 per month per store.[19] A ShopRite store in West Philadelphia was driven out of business after seeing a 25 percent loss in sales.[20]

Furthermore, a study published in 2017 found that the soda tax had destroyed 1,192 jobs in Philadelphia, reduced the city's economic output by nearly $80 million, and eliminated $55 million in labor income to workers.[21]

Philadelphia's case is a reminder that the effect that such taxes often have negative ramifications for the local community.

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[16] Stephan Seiler, Anna Tuchman, and Song Yao, "The Impact of Soda Taxes: Pass-Through, Tax Avoidance, and Nutritional Effects," Stanford University Graduate School of Business Research Paper No. 19:12, October 26, 2019, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3302335.

[17] Jill Young Miller, "Philadelphia soda tax lacks fizz, study finds," Washington University in St. Louis, December 6, 2019, https://source.wustl.edu/2019/12/philadelphia-soda-tax-lacks-fizz-study-finds/.

[18] "The Economic Impact Of Philadelphia's Beverage Tax," Oxford Economics, December 2017, https://www.ameribev.org/files/resources/oe-economic-impact-study.pdf.

[19] Ayana Jones, "Report: Soda tax pinching markets," *The Philadelphia Tribune*, September 12, 2017, https://www.phillytrib.com/news/report-soda-tax-pinching-markets/article_8c46e59b-51a6-5049-a8ba-9d970890aa1d.html.

[20] Eric Boehm, "Philadelphia's Soda Tax Just Killed a Grocery Store," *Reason*, January 4, 2019, https://reason.com/2019/01/04/philadelphias-soda-tax-kills-another-gro/.

[21] "The Economic Impact Of Philadelphia's Beverage Tax," Oxford Economics, December 2017, https://www.ameribev.org/files/resources/oe-economic-impact-study.pdf.

SSB Taxes are Highly Regressive

An important factor in assessing any tax initiative is its distributional impact on different income groups. Like other "sin" taxes, SSB taxes are highly regressive, falling most heavily on poor households.

The average American household, for example, consumes approximately 4,106 fluid ounces (32 gallons) of SSBs annually.[22] A 1.5 cent-per-ounce tax -- a typical rate among cities that have adopted an SSB tax in the U.S. -- represents a yearly tax burden of nearly $62 per household. Of course, this assumes that consumption patterns do not significantly change in response to the tax. But as the previous section lays out, demand for sugary beverages is very inelastic, meaning that higher prices are unlikely to cause significant drops in consumption.

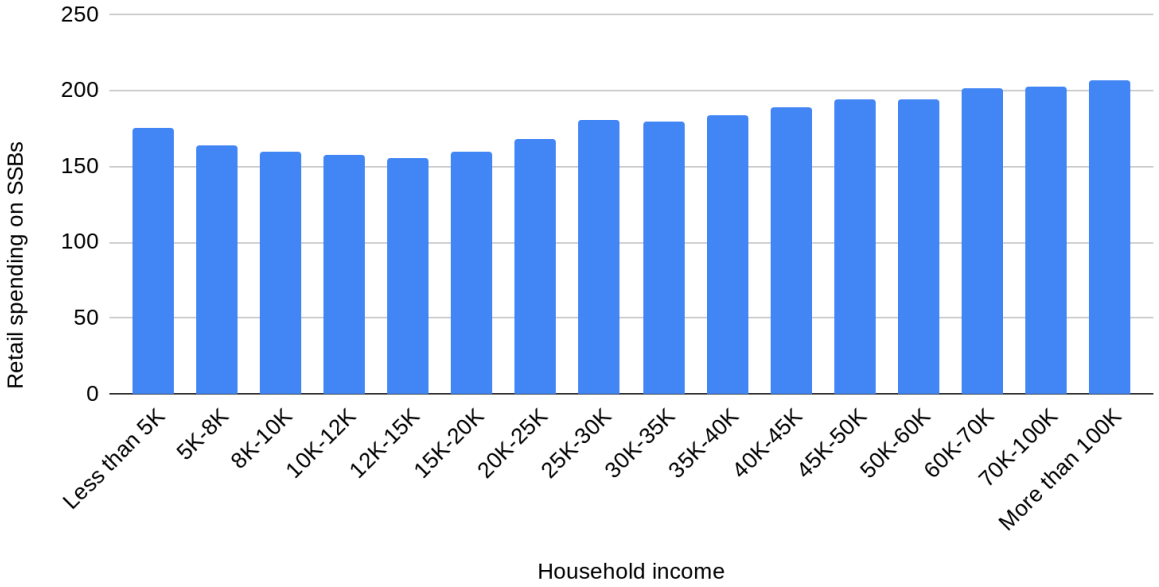
According to a detailed analysis of consumer data by the Tax Foundation, the share of household income devoted to expenditures on sugar-sweetened drinks decreases by about 0.01 percent for every 1 percent increase in income, implying a regressive expenditure pattern. Researchers estimated that if a nationwide tax were imposed on SSBs, 78 percent of tax collections would come from households with income under $100,000.[23]

As Figure 1 shows, there is little variation in SSB spending levels across income groups. Households reporting less than $5,000 of income in 2015 spent an average of $175 on SSBs, while households earning more than $100,000 spent an average of $207. As a result, there are substantial differences in the share of income devoted to SSBs. In the lowest income group, spending on SSBs accounted for seven percent of income in 2015, compared to about 0.2 percent of income among the highest-earning households, a 35-fold difference.

[22] Justin Ross and Felipe Lozano-Rojas, "Are Sugar-Sweetened Beverage Taxes Regressive? Evidence from Household Retail Purchases," Tax Foundation, June 19, 2018, https://taxfoundation.org/soda-taxes-regressive/.
[23] Justin Ross and Felipe Lozano-Rojas, "Are Sugar-Sweetened Beverage Taxes Regressive? Evidence from Household Retail Purchases," Tax Foundation, June 19, 2018, https://taxfoundation.org/soda-taxes-regressive/.

Figure 1: Retail Spending on SSBs by Household Income, 2015

Source: Tax Foundation, Nielsen Consumer Panel



Substitution to Other Goods

SSB tax advocates often underestimate substitution effects -- the tendency for consumers to switch to other high-calorie products that aren't subject to the tax. From a caloric perspective, substituting taxed SSBs with food or other drinks with equal or higher energy content (e.g. alcohol, milk, or juice) will negate the public health benefits of reducing SSB intake.

Although it is difficult to study the complex demand interrelationships between beverage and food categories, an extensive part of the literature seems to suggest that, to the extent consumers respond to SSB taxes, they tend to shift to other high-calorie goods. For example, a 2010 paper used state soft drink sales, excise tax information between 1989 and 2006, and data from the National Health Examination and Nutrition Survey to investigate the dietary effects of soft drink taxation among children and adolescents. It concluded that reductions in soda consumption in response to SSB taxes are completely offset by increases in

consumption of other high-calorie drinks.[24] In the case of Philadelphia, for example, findings suggest that the SSB tax made soft drinks more expensive than some beer,[25] leading to a 5 percent increase in alcohol consumption.[26]

Conclusion: A Convenient Scapegoat

By focusing their attention on sweetened drinks, policymakers ignore other crucial factors in obesity. Consider, for example, that the obesity rate in the Netherlands is less than half the rate in Greece, even though the Dutch consume more than four times as many soft drinks as Greeks.[27] In the U.S., SSBs account for only about 7 percent of average calorie intake among adults and children,[28] and unlike other behaviors that are the target of specific taxes (like smoking), moderate SSB consumption is compatible with a healthy diet.

As an editorial in the *Journal of the American Medical Association* notes, "...SSB consumption has been declining since the mid-1990s. During this period the prevalence of obesity has been increasing, suggesting that reducing general caloric intake is likely more important than reducing SSB consumption alone."[29] In summary, imposing punitive taxes on SSBs is a relatively narrow approach to tackling America's public health challenges.

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[24] Jason M. Fletcher, David E. Frisvold and Nathan Tefft, "The Effects Of Soft Drink Taxes On Child And Adolescent Consumption And Weight Outcomes," *Journal of Public Economics*, December 2010, Vol. 94:11–12, pp. 967-974, https://www.sciencedirect.com/science/article/abs/pii/S0047272710001222.

[25] Scott Drenkard, "Sports Drinks Are Now More Expensive than Beer Thanks to the Philadelphia Soda Tax," Tax Foundation, January 4, 2017, https://taxfoundation.org/sports-drinks-are-now-more-expensive-beer-thanks-philadelphia-soda-tax/.

[26] Mari A. Schaefer, "Alcohol Sales Are Up in Philly. Is the Soda Tax Driving Us to Drink?" *The Philadelphia Inquirer*, January 26, 2018, https://www.inquirer.com/philly/health/sweetened-beverage-tax-alcohol-sales-wine-beer-consumption-20180125.html.

[27] "Why Food And Drink Taxes Don't Work," Union of European Soft Drinks Associations, 2014, https://www.fooddrinktax.eu/wp-content/uploads/2018/05/UNESDA_Online_Infographic.pdf.

[28] Lydia Ramsey, "A Shocking Number of All the Calories You Consume in a Day Come from Sugary Drinks," *Business Insider*, January 26, 2017, https://www.businessinsider.com/how-much-of-our-daily-calories-come-from-sugar-sweetened-drinks-2017-1.

[29] Edward H. Livingston, "Reimagining Obesity in 2018: A JAMA Theme Issue on Obesity," *Journal of the American Medical Association*, January 16, 2018, Vol. 319:3, pp. 238–240, https://jamanetwork.com/journals/jama/article-abstract/2669708.