

Taxation of Sweetened Beverages in Santa Fe

I. Overview

A 2-cent per ounce excise tax on sugar-sweetened beverages (SSBs) could generate approximately \$7.7 million in new revenue for the City of Santa Fe each year. An SSB tax could also substantially reduce consumption of soft drinks by the most price-sensitive and vulnerable city residents – children and people living in poverty. An excise tax on SSBs could fund 966 high-quality, extended-day preschool slots, eliminating the city's unmet need for high-quality preschool.

II. Sweetened beverage tax description

Sugar-sweetened beverages (SSBs) are a major source of sugar in the diets of many Americans and a contributor to obesity.¹ Several recent studies provide evidence that increasing the price of SSBs can decrease the prevalence of overweight and obesity.² Taxes on sugar-sweetened beverages have the potential to decrease SSB consumption by vulnerable populations³ while generating substantial revenue with which to fund beneficial public programs.¹

Although much attention has been paid to the revenue and health promoting potential of taxing SSBs, relatively few such taxes have actually been implemented. The first significant excise tax on SSBs was implemented by Berkeley California on March 1, 2015 at a rate of 1 cent per ounce. Philadelphia subsequently adopted a 1.5-cent per ounce levy that will take effect on January 1, 2017. Berkeley's tax provides revenue to the city general fund while Philadelphia's tax will fund pre-K. This report estimates the potential short-term revenue impact of a Santa Fe SSB tax modeled on those of Berkeley and Philadelphia and the capacity of such a tax to fund high quality public pre-K in Santa Fe. The costs and benefits of a Santa Fe pre-K program are detailed in a companion report.

III. Estimation methodology

TAX LIABILITY AND TAX BURDEN

Beverage distributors would be responsible for paying an excise tax on SSBs, but distributors would likely pass at least a portion of the tax on to consumers in the form of higher prices. The extent to which the tax burden is shifted to consumers will determine the degree to which the tax impacts consumption and thus how much revenue it generates. At least three studies have attempted to gauge the extent to which Berkeley's 1 cent tax has impacted retail prices for SSBs and thus their consumption. One study found that distributors had passed less than 50 percent of the tax along to consumers,⁴ while another found that almost 100 percent of the tax was reflected in higher retail prices.⁵ A third study found that the amount of tax shifting varied by store, product, and package size, but averaged 47 percent.⁶

¹ Recent research indicates that SSB taxes can also produce substantial long-term cost savings by reducing the prevalence of obesity and diabetes. See: Cabrera Escobar, M. A., Veerman, J. L., Tollman, S. M., Bertram, M. Y., & Hofman, K. J.. Evidence that a tax on sugar-sweetened beverages reduces the obesity rate: a meta-analysis. BMC Public Health, (2013) 13, 1072.

TAX BASE

The proposed tax would be levied on the volume of SSBs distributed to Santa Fe businesses for retail or food service sale. The 2010 Dietary Guidelines for Americans define sugar sweetened beverages as "liquids that are sweetened with various forms of sugars that add calories. These beverages include, but are not limited to, soda, fruit-ades and fruit drinks, and sports and energy drinks."⁷ Sweetened coffees, teas, and flavored waters are other rapidly growing components of the SSB market.

Berkeley excludes non-caloric beverages, including artificially sweetened "diet drinks," from the SSB tax base. Philadelphia, on the other hand, includes zero-calorie and artificially sweetened drinks in the tax base, exempting from the tax only infant formula; beverages containing more than 50 percent fresh fruit, vegetables, or milk; and drinks the customer sweetens themselves.²

The volume of beverages distributed in Santa Fe is determined by household and hospitality industry demand. Because there are no publicly available state-specific estimates of SSB consumption, national estimates are used as the basis for estimates of SSB demand at the state and local levels. Americans consume an average of 42 gallons of SSBs annually.⁸ American SSB consumption has declined by about .9 percent in each of the past several years.⁹

TAX RATE

SSB excise taxes are levied in pennies per ounce. As noted earlier, Berkeley's tax is 1 cent/ounce and Philadelphia's is 1.5 cents/ounce. Depending on the extent to which distributors pass the tax on to consumers, a 2 cent/ounce SSB excise tax would add up to 24 cents to the price of a 12-ounce can, \$1.35 to the cost of a 2-liter container, and \$2.88 to the cost of a 12-pack purchased in Santa Fe. **Table I** shows SSB excise taxes by volume at rates of 1 cent through 3 cents per ounce.

Table 1 Sugar-sweetened beverage tax amounts by package size at rates of 1¢/oz. through 3¢/oz.

SSB tax on standard size beverages by rate				
Package size	1 cent	1.5 cents	2 cents	3 cents
7.5 oz. "mini-can"	\$0.08	\$0.11	\$0.15	\$0.23
12 oz. can	\$0.12	\$0.18	\$0.24	\$0.36
20 oz. bottle	\$0.20	\$0.30	\$0.40	\$0.60
2-liter bottle	\$0.68	\$1.01	\$1.35	\$2.03
6-pack of cans	\$0.72	\$1.08	\$1.44	\$2.16
12-pack case of cans	\$1.44	\$2.16	\$2.88	\$4.32
24-pack case of cans	\$2.88	\$4.32	\$5.76	\$8.64

IV. Revenue Impact

Own price elasticity of demand (OPED) measures how demand for a good or service changes in response to a 1 percentage point change in its price. The degree to which consumers will decrease consumption as a result of a tax-induced price increase determines how much revenue the tax will generate. If demand is *elastic* consumers will react to the tax increase by greatly reducing their consumption of SSBs, and the new tax will generate relatively little revenue. Conversely, if demand is relatively *inelastic*, changes in price will impact consumption very little, resulting in maximal tax revenue.

² Philadelphia includes diet drinks in the SSB tax base by defining "Sugar Sweetened Beverages" to include non-alcoholic beverages that list "any form of artificial sugar substitute" as an ingredient. Chapter § 19-4101 (3)(a)(2) Philadelphia Code

Not surprisingly, opponents of SSB taxes have asserted that demand for SSBs is extremely elastic and proponents have tended to forecast inelastic demand,¹⁰ resulting in widely divergent fiscal impact estimates. The reality is somewhere between the two extremes. Research suggests that changes in demand for SSBs are roughly proportional to changes in price. Recent US estimates of the OPED for SSBs range from -.79¹¹ to -1.29,¹² meaning that a 10 percent change in price will reduce consumption by between 7.9 percent and 12.9 percent.¹³ Low-income households, residents of low-income neighborhoods, and children tend to be more price-sensitive than more prosperous, older consumers,^{14 15} suggesting that an SSB tax will be particularly effective in reducing consumption by these populations.

The SSB tax base is the volume of SSBs purchased in Santa Fe by city residents, people who live outside the city limits, but purchase groceries in Santa Fe, and tourists. The two components of the base will be addressed separately, beginning with consumption by Santa Fe residents.

The resident tax base prior to imposition of the tax is estimated by multiplying Santa Fe's population (82,800) by annual, per capita SSB consumption (41.6 gallons). The resident tax base after imposition of the tax will be lower because some city residents will consume fewer SSBs as a result of the tax. The degree to which consumption declines as a result of the tax will be determined by: (1) the extent to which distributors pass the tax along to consumers, and (2) consumer price elasticity of demand.

As noted previously, research indicates that distributors shift somewhere between 40 percent and 95 percent of SSB excise taxes onto consumers. If distributors absorb 60 percent of the tax (and pass along 40%), consumers will pay an additional 8/10ths of a cent per ounce. If distributors absorb 5 percent of the tax, consumers will pay an additional 1.9 cents per ounce.

Table 2 depicts the impact of a 2¢/oz. excise tax as a function of the percentage passed through by distributors including the amount of the tax paid by consumers, the after-tax price, and the percent increase in price as a result of the tax. The 2016 national average price of SSBs is approximately 6.0 cents/ounce or \$7.68/gallon.³

Table 2 Impact of pass-through percentage on after-tax price paid by consumers

Percentage of tax passed through to consumers	40%	70%	95%
Amount of tax passed through to consumers (¢/oz)	.8 ¢	1.4 ¢	1.9 ¢
After tax price-per-ounce	6.8 ¢	7.4 ¢	7.9 ¢
Percent increase in price	13%	23%	32%

SSB consumers are expected to respond to a 10 percent increase in price by decreasing consumption between 7.9 percent and 12.9 percent. Table 3 shows the change in quantity demanded resulting from a 23 percent increase in price assuming own-price elasticities of demand of -.79, -.97, and -1.29.

Table 3 Derivation of post-tax consumption with differing own-price elasticities of demand

Pre-tax consumption (oz)	440,681,472	440,681,472	440,681,472
Percent increase in price	23%	23%	23%

³ The 2012 national average price for SSBs was estimated as 5.9 cents per ounce (See: Powell LM, Isgor Z, Rimkus L, and Chaloupka F. (2014). Sugar-Sweetened Beverage Prices: Estimates from a National Sample of Food Outlets. Chicago, IL: Bridging the Gap Program, Health Policy Center, Institute for Health Research and Policy, University of Illinois at Chicago. Retrieved from: www.bridgingthegapresearch.org). The estimate by Powell et al was adjusted to 2016 dollars using an average annual food inflation rate of .63 percent. (See: Trading Economics.com United States Food Inflation, 1914-2016).

Own price elasticity of demand	-0.79	-0.965	-1.29
Percent decrease in consumption	-19%	-23%	-30%
Post-tax consumption (oz)	359,054,827	340,972,976	307,392,394

Table 4 shows local resident SSB tax revenue at estimated minimum, mid-point, and maximum post-tax consumption levels.

Table 4 Resident SSB tax revenue at the minimum, mid-point, and maximum consumption levels

	Minimum	Mid-point	Maximum
Post-tax consumption (oz)	259,789,152	340,972,976	394,037,675
Resident excise tax revenue	\$5,195,783	\$6,819,460	\$7,880,753

HOW WOULD AN SSB EXCISE TAX IMPACT SNAP RECIPIENTS?

SNAP benefits may be used to purchase SSBs. Federal law prohibits state and local governments from taxing the sale of food purchased with SNAP benefits. An excise tax imposed on distributors would be incorporated into the price of the beverage and would therefore be passed along to SNAP recipients in a manner permissible under federal law. Thus, SNAP recipients would pay the same amount of excise tax as other SSB consumers. Increasing the price of SSBs is expected to significantly reduce consumption by lower income households.

Visitors spend roughly \$190 million on food and beverages in Santa Fe each year.¹⁶ Assuming 3 million visitor days per year and SSB consumption of 15 ounces per visitor per day yields total annual visitor consumption of 45 million ounces (351,563 gallons). Summing resident and visitor consumption yields total consumption between 304.8 million ounces to 439 million ounces and tax revenue of \$6.1 million to \$8.8 million. **Table 5** shows minimum, mid-point, and maximum values for resident consumption, visitor consumption and total tax revenue.

Table 5 Minimum, mid-point, and maximum values for resident consumption, visitor consumption and total tax revenue

	Minimum	Mid-point	Maximum
Post-tax resident consumption (oz)	259,789,152	340,972,976	394,037,675
Visitor consumption (oz)	45,000,000	45,000,000	45,000,000
Total consumption	304,789,152	385,972,976	439,037,675
Tax revenue	\$6,095,783	\$7,719,460	\$8,780,753

FIVE YEAR FORECAST

As noted earlier, American consumption of SSBs is declining. **Table 6** provides a five-year revenue forecast assuming mid-point consumption levels, .9% annual decrease in per capita consumption, 1 percent annual growth in population, no change in average annual visitor days, and a .63 percent annual inflation rate for food.

Table 6 Santa Fe SSB excise tax 5-year revenue forecast

Year	2016	2017	2018	2019	2020	2021	2022
Population	82,800	83,628	84,464	85,309	86,162	87,024	87,894
SSB gall per capita	41.6	41.2	40.9	40.5	40.1	39.8	39.4
Pre-tax resident consumption (oz)	440,681,472	440,637,404	440,593,340	440,549,281	440,505,226	440,461,175	440,417,129
Post-tax resident	340,972,976		340,904,784	340,870,694	340,836,607	340,802,523	340,768,443

consumption (oz)		340,938,878					
Visitor consumption (oz)	45,000,000	44,550,000	44,104,500	43,663,455	43,226,820	42,794,552	42,366,607
Total consumption	385,972,976	385,488,878	385,009,284	384,534,149	384,063,427	383,597,075	383,135,050
Tax revenue	\$7,719,460	\$7,709,778	\$7,700,186	\$7,690,683	\$7,681,269	\$7,671,942	\$7,662,701

Population growth offsets declining per capita consumption over the forecast period, leaving tax revenue largely unchanged. However, during the same period, population growth and inflation will increase the need for pre-K and its cost. The fact that program costs are likely to increase while revenue remains fixed will impact program sustainability and should be factored into program planning.

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² Cabrera Escobar, M. A., Veerman, J. L., Tollman, S. M., Bertram, M. Y., & Hofman, K. J. (Evidence that a tax on sugar sweetened beverages reduces the obesity rate: a meta-analysis. BMC Public Health, 2013 13, 1072. Retrieved from: <http://doi.org/10.1186/1471-2458-13-1072>

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⁸ Babey SH, Jones M, Yu H, Goldstein H. Bubbling Over: Soda Consumption and Its Link to Obesity in California. UCLA Center for Health Policy Research and California Center for Public Health Advocacy, 2009.

⁹ 2016 Beverage Marketing Corp. 2016 Non-Alcoholic Beverage Trend Analysis. April, 2016. Retrieved from: http://beverageforum.com/images/2016presentations/WorkshopI_Non-Alc-Final.pdf

¹⁰ Nadolny, T.L. (2016, March 16). Two views on how tax would hit soda consumption. Retrieved from: http://articles.philly.com/2016-03-16/news/71547012_I_soda-industry-sugary-drinks-fountain-soda

¹¹ Andreyeva, T., Long, M.W., and Brownell. (2010) "The Impact of Food Prices on Consumption: A Systematic Review of Research on the Price Elasticity of Demand for Food." 100 Am. J. Pub. Health 216.

¹² Cabrera Escobar, M. A., Veerman, J. L., Tollman, S. M., Bertram, M. Y., & Hofman, K. J. (2013). Evidence that a tax on sugar sweetened beverages reduces the obesity rate: a meta-analysis. BMC Public Health, 13, 1072. Retrieved from: <http://doi.org/10.1186/1471-2458-13-1072>

¹³ M.A. Colchero, J.C. Salgado, M. Unar-Munguía, M. Hernández-Ávila, J.A. Rivera-Dommarco, Price elasticity of the demand for sugar sweetened beverages and soft drinks in Mexico, Economics & Human Biology, Volume 19, December 2015, Pages 129-137, ISSN 1570-677X.
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