

Zwick Center for Food and Resource Policy

Working Paper Series

No. 19

**How Effective is Public Policy in Decreasing  
Soda Consumption?  
An Assessment of Four Policy Options**

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April 2013

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# **How Effective is Public Policy in Decreasing Soda Consumption?**

## **An Assessment of Four Policy Options**

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Presented at the Workshop on Beverage Markets and Policy,  
Northeastern Agricultural and Resource Economics Association Meetings  
June 22-23, Ithaca, New York

### **Abstract**

This paper examines the effectiveness of four policy options to decrease the consumption of carbonated soft drinks (CSDs). They are: (1) a soda tax (1 cent per ounce), (2) a ban on television advertising, (3) limiting calories to 100 per 12 oz volume; and (4) banning large containers such as the 2 lt. bottle. We apply the Berry, Levinsohn and Pakes (1995) demand model to data for 12 CSD brands in 3 container sizes over seven cities and 36 months to estimate consumers' preferences for CSD. Limiting the size of containers (e.g., banning the 2 lt. bottle) was found to be the most effective policy option and a tax on calories was found to be the weakest in terms of effectiveness in decreasing the consumption of CSDs. The declines in the national consumption of CSDs were found to be approximately -6.3%, -15.4%, -15.5% and -15.8 for a tax, advertising ban, limiting calories, and restricting container sizes, respectively.

Key words: advertising, demand, policy, taxes, obesity, consumer behavior, sodas, carbonated soft drinks

JEL Codes: D12, L66, Q18, I18

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They are grateful to Adam Rabinowitz for his invaluable help in managing the raw data. We also acknowledge funding from USDA-NIFA-2010-34178-20766 grant. The authors are of course responsible for all remaining errors.

April 16, 2013

# **How Effective is Public Policy in Decreasing Soda Consumption?**

## **An Assessment of Four Policy Options**

### **1. Introduction**

There is little debate on the negative health consequences of excessive consumption of carbonated soft drinks (CSDs). Although not the only culprit behind the increases in obesity rates in the U.S. and elsewhere in the last few decades, sweetened CSDs constitute the main source of added calories (Marriott et al, 2010; Johnson and Yon, 2010). As such, it is an important contributor to the obesity epidemic and related diseases. While the nutritional and medical science side of the issue is well documented, the ongoing debate focuses on how to effectively change the behavior of consumers to making healthier beverage and food choices. This paper focuses on evaluating the impact of four alternative policy instruments on the consumption of CSDs.

The policy focus of previous work on the economics of obesity, particularly on CSDs, has been on the effects of imposing taxes at the point of sale. The preponderant empirical evidence is that although these taxes can be generally effective in curbing consumption, they are quasi-ineffective in curbing obesity (Fletcher, Frisvold and Tefft, 2010; Marlow and Shiers, 2010; Lopez and Fantuzzi, 2012) unless they are very large. A large tax on CSDs, similar in magnitude to those applied to cigarettes, might be effective as prices are pushed to discretionary levels but are politically infeasible due to industry lobbying, income regressive, and substitution of other sugary beverages, which may introduce a rebound effect on calorie intake.

There is a lack of research on other policy alternatives that can be used to curb the consumption of CSDs. One is restriction of television advertising of CSDs as practiced in other

countries (United Kingdom since 2007 and Quebec, Canada, since 1980). In the United States, the Coca Cola Company and 15 food and beverage companies pledged to shift advertising to encourage healthier dietary choices and healthy lifestyles through CFBAI or Children's Food and Beverage Advertising Initiative (Better Business Bureau, 2013). However, this voluntary program does not seem to be having a significant impact on consumption. Another policy instrument is to reduce package sizes as it seems to induce a reduction in the total consumption of CSDs. Restricting serving sizes (while allowing multiple servings) of CSDs in restaurants has been effective in reducing total consumption of CSDs at these sites. This is consistent with experiments where increasing beverage portion sizes significantly increase the weight of beverage consumed (Flood, Roe and Rolls, 2006). Another policy alternative is to reduce sugar content, which would probably discourage consumption among sugar lovers. Finally, as important, an education campaign to alter consumer valuation of sugar content could significantly affect CSD choices as it would for other types of sugar beverages.

The purpose of this paper is to examine and compare the effectiveness of four types of public policy instruments that can potentially curb the consumption of CSDs, with implications for other high-calorie food and beverages. These are: (1) a soda tax (1 cent per ounce), (2) a ban on television advertising, (3) limiting calories to 100 per 12 oz volume; and (4) banning large containers such as the 2 lt. bottle. A random coefficient logit demand model is estimated with Nielsen datasets, and policy simulations for the four scenarios are conducted and compared in terms of changes in consumption of CSDs. Implications for other beverages and food choices are given.

## 2. Empirical Model

Use  $j=1, \dots, J$  to denote a CSD product, and  $j=0$  to denote a general outside product in the beverage market. For CSD products, the subscript  $g$  includes two dimensions of the product: brand and size. That is, a 2-liter bottle and a 12-oz can of Dr. Pepper are considered different products indexed by a different  $j$ .

We specify the conditional indirect utility of consumer  $i$  from purchasing CSD product or an outside product in market  $m$  as

$$\begin{aligned} u_{ijm} &= \alpha_i p_{jm} + \varphi_{1i} \text{MiddleSize}_j + \varphi_{2i} \text{LargeSize}_j + \gamma_i \text{Ad}_{jm} + X_j' \beta_i + \xi_{jm} + \mu_{ijm} + \epsilon_{ijm}, \\ &= \delta_{jm} + \mu_{ijm} + \epsilon_{ijm}, \end{aligned} \quad (1)$$

where  $p_{jm}$  is the unit price per oz of soda drink product  $j$  in market  $m$ .  $X_j$  is a vector of observed product nutritional characteristics of soft drink brand  $I$ , including calories, sugar, sodium, and caffeine content. The nutritional characteristics are common to a brand with different package sizes. Compared to a small size bottle/can of less than 12 oz, “MiddleSize” is a dummy variable that equals 1 if the bottle/can is between 16.9 oz and 34 oz, and “LargeSize” is a dummy variable that equals to 1 if the bottle/can is between 33.8 oz and 101.4 oz. These two dummy variables are used to account for consumers' preference for soft drink sizes.  $\text{Ad}_{jm}$  is advertising goodwill, which captures the carry-over effects of advertising's impact on demand for brand  $j$  in market  $m$ . The indirect utility  $u_{ijm}$  can be decomposed into three parts: a mean utility term  $\delta_j$ , which is common to all consumers; a brand-specific and consumer-specific deviation from that mean,  $\mu_{ij}$ , which includes interactions between consumer and product characteristics; and idiosyncratic tastes, where  $\epsilon_{ijm}$  is a mean zero stochastic term distributed independently and identically as a type I extreme value distribution. The utility deviations  $\mu_{ijm} = X_j' (\Omega D_{im} + \Sigma V_i)$  depend on the vector  $D_{im}$  of household-specific variables, where  $\Omega$  is a matrix of coefficients that measure how

the taste characteristics vary across households and  $\Sigma$  is a scaling matrix. The unobserved household characteristics  $V_i$  are assumed to have a standard multivariate normal distribution.  $\xi_{jm}$  captures unobserved product fixed effects, and  $\epsilon_{ijm}$  is the idiosyncratic shock to the unobserved utility.

To complete the model and to define the market (and, hence, market shares) an outside good is included to give the consumer the possibility not to buy any of the brands included in the choice set. A consumer purchases a unit of a brand in the set or the outside good. The probability that consumer  $i$  purchases a unit of brand  $j$  in market  $m$  is

$$s_{ijm} = \frac{\exp(\delta_{jm} + \mu_{ijm})}{1 + \sum_{r=1}^J \exp(\delta_{rm} + \mu_{irm})} . \quad (2)$$

Aggregating over consumers, the market share of the  $j^{th}$  brand corresponds to the probability that the  $j^{th}$  brand is chosen in market  $m$ .

### 3. Data and Estimation

This analysis combines two Nielsen datasets: advertising and household (Homescan) panel data. The advertising data set contains brand-level information on weekly advertising expenditures and weekly Gross Rating Points (GRPs) for national (cable, network and syndicated) and local (spot) TV networks in 7 designated market areas (DMAs) from 2006 to 2008. The DMAs are: New York, Detroit, Washington D.C., Atlanta, Chicago, Los Angeles and Seattle. A GRP measures the frequency of viewing a particular advertisement times the percentage of people reached over a specific time period. For example, if 10% of all households in a specific DMA watched the same specific commercial five times during a week, then a commercial has a GRP rating of 50 during that week.

The Homescan data contains information on product characteristics (e.g., flavor, packaging), package sizes, marketing (e.g., unit price and in-store displays), and location and

time of all purchases. The CSD purchase and advertising data were aggregated from weekly to monthly observations. By combining these two datasets, we can directly link brand-level advertising exposure to brand-level purchases. The potential market size, used to compute market shares, was defined for each period and DMA as the combined per capita consumption (in volume) of CSDs plus the outside good (e.g., juices, water and milk) times population.

Product characteristics in the estimating sample include price, nutritional characteristics, and television advertising. Price is the average unit price for all CSD purchases (e.g., sizes, alternative outlets). Based on previous studies (e.g., Lopez and Fantuzzi, 2012), sugar, sodium and caffeine content are key nutritional indicators that affect CSD choices. Following Dubé et al. (2005), we model advertising as goodwill in order to capture the carryover effects of advertising's impact on demand using six lag periods, resulting in 29 monthly observations in the estimating sample. In addition, prior to estimation, both advertising GRPs and nutritional characteristics were scaled between 0 and 1.

Table 1 presents the summary statistics for CSD product brand characteristics. The estimating sample contains 5,580 observations based on 29 monthly periods (July 2006 to November 2008), 12 brands of CSDs in three sizes, and 7 DMA markets. The CSD characteristics presented in the table are averaged out over periods, market areas, and sizes. There is an extremely high correlation between calories and sugar and CSDs do not have other sources of calories. Table 2 presents a summary in terms of bottle sizes, their average prices, and location of purchase. It is interesting to note that the 20 oz bottles are significantly more expensive (three to four times) per oz than the 12 oz cans or the 2 lt. bottles. The aluminum cans are the most popular in the sample, followed by the 2 lt. bottles in terms of volume.

## **4. Empirical Results**

### **4.1 Demand Results**

Table 3 shows the estimation results. Overall, the results seem plausible in terms of signs and expected coefficients. Several specification tests were conducted. The first stage F-statistics and Hansen J test results indicate that the instrumental variables are valid instruments and relatively strong, alleviating concerns with endogeneity of price. The Hansen J statistic indicates that the model failed to reject the null hypothesis of zero expected moments, lending credibility to the model specification.

Nearly all key parameter estimates in Table 3 are statistically significant at the 5% level. As expected, consumers have a negative and strong valuation of price and a positive valuation of brand advertising. The results for company fixed effects show that relative to Dr. Pepper brands, consumers have a higher intrinsic valuation of Coca-Cola brands and are relatively indifferent between Dr. Pepper's and PepsiCo's brands. Further econometric results show that consumers have on average a positive valuation of calories and caffeine content and a negative valuation of sodium content. From a nutritional standpoint the positive coefficient for calories might reflect preferences for what is perceived as an average preference for flavor over nutritional concerns. Sugar is exclusively the source of calories in CSDs and is consumed excessively in the American diet and this consumer positive valuation (both at the mean utility and for unobservable consumer characteristics) is a concern for its link to the obesity epidemic.

Table 4 presents the own-price elasticities of demand by CSD brand and container size. They were negative and elastic, ranging from -1.022 for the 167 oz (2 lt.) Pepsi Diet to -4.724 for the 20 oz Sunkist Regular. It is interesting to note that the demand for 20 oz containers are the most price sensitive for the CSD category and that the demand for the 12 oz cans is only



moderately less price sensitive than that for the 2 lt. bottles. These magnitudes of the estimated own-price elasticities are consistent with previously estimated elasticities of CSD demand using scanner data: For example, Zhen et al. (2011), using product categories rather than brand-level elasticities, reports them in the -1 to -2 range for sugar-sweetened beverages while Dubé (2004) reports them in the -2 to -3.5 range for specific sizes and brands of CSDs. Andreyeba et al. (2010) reports elasticities for 14 soft drinks having a mean of -0.79 and a range of -0.13 to -3.18 at various levels of category aggregation, while Dhar et al. (2005) reports them between -2.7 and -4.4. On the high side, Chan (2006) reports own-price elasticities for CSDs at the household level between -5 and -11.

## **4.2 Policy Simulations**

The estimated taste parameters in the demand equation allow us to capture how price, advertising, package size and calorie content affect consumers' demand and choices of CSDs. Given the plausibility of the econometric results, we use the parameters obtained from the demand estimation to simulate alternative policy scenarios over the sample period.

Specifically, we conduct the following four sets of policy simulations to examine how consumers' consumption of CSD might be affected by different policies:

- (1) Soda taxes at the point of consumption: we impose a \$0.01 per ounce tax on soft drinks
- (2) Television advertising restrictions: we impose either absolute voluntary industry restrictions or government advertising bans
- (3) Downsizing packages: we eliminate the offering of large-size soft drinks (2 lt bottles); and

(4) Product reformulation (reducing sugar content): we limit calories to 100/12 oz which can be obtained either through sugar reduction or increase use of low calorie sweeteners in the formulation.

We conducted policy simulations to examine how consumers' consumption of CSD might be affected by the four policy scenarios outlined above. The results are shown in Table 6.

The first policy scenario (S1) imposes a TV advertising ban. In particular, we assessed changes in market shares of the beverage category. These changes translate directly into changes in consumption since by design the market size of all beverages (the denominator of market shares) remained fixed. An advertising ban would result in a 15.4% decline in the market share of all CSDs which would be compensated by an increase in the market share of outside goods (milk, juices, and water). This is a dramatic decline in the consumption of CSDs but there is also a rebound effect in outside goods. The final effect on obesity would depend on what those choices would be.

The second policy scenario (S2) imposes a 1 cent tax per oz at the retail level. Note that this would translate into a 12 cent tax on a can of CSD or 68 cents for a 2 lt. bottle. Thus, it can be deemed as a significant tax and is consistent with what is being proposed in many states. As shown in Table 6, such a tax will only induce a 6.32% decline in the global consumption of CSDs. In fact, such a tax was shown to have the lowest impact on curbing CSD consumption among the policy scenarios considered. Of course, a larger tax such as a 3 or 4 cent an ounce would be a formidable impact but it would seem politically infeasible as even a 1 cent a tax has been defeated at the ballot. An argument against it is not only interfering with free choices but

also that such a tax is likely to be regressive given that low income consumers are heavier drinkers of CSDs.

The third policy scenario (S3) considers restricting calorie content to 100 per every 12 oz. This limit on calories is consistent with many food and beverage products being advertized as 'healthy' or considered low calorie. In any event, the results indicate that such a limitation would have a severe impact on CSD consumption. In fact, a 15.52% decline in the global consumption of CSDs, making it slightly more stringent than a ban on advertising. What it is interesting is that such a policy, in principle designed to make sugary drinks more attractive to a segment of the population, would apparently result in an increase of diet CSDs at the detriment of the reformulated sugary drinks.

The four policy scenario (S4) corresponds to a policy banning the 2 lt. bottles, forcing consumers to purchase smaller containers. This policy will increase the consumption of CSDs in 12 oz and 20 oz but would result in a 15.75% decline of global soda consumption. This is the highest and most effective policy to curb the consumption of CSDs among the policy options considered. This result is consistent with previous findings on the effects of the size of containers or servings on actual energy and volume consumption. With the recent defeat of a similar policy in New York City advocated by Mayor Bloomberg, this policy appears to be a promising course of action if the policy objective is to reduce the consumption of CSDs or other sugary drinks.

## **5. Conclusion**

This paper examines the effectiveness of four policy options to curb the consumption of carbonated soft drinks (CSDs). They are: (1) an specific tax (1 cent per ounce), (2) a ban on television advertising, (3) limiting calories to 100 per 12 oz volume; and (4) banning large

containers such as the 2 lt. bottle. We apply the Berry, Levinsohn and Pakes (1995) demand model to data for 12 CSD brands in 3 container sizes over seven cities and 36 months to estimate consumers' preferences for CSD characteristics, including calories, size of container, price, and advertising. Empirical econometric results were as expected and therefore used for the four policy scenarios. Limiting the size of containers (e.g., banning the 2 lt. bottle) was found to be the most effective policy option and a tax on calories was found to be the weakest in terms of effectiveness in decreasing the consumption of CSDs. The declines in the global consumption of CSDs were found to be approximately -6.3%, -15.4%, -15.5% and -15.8 for a tax, advertising ban, limiting calories, and restricting container sizes. Further research is needed to assess the extent of a rebound effects in terms of the types of alternative beverages that would substitute for CSDs as consumption declines due to policy-driven actions.

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**Table 1. CSD Brand Data Summary over Seven Designated Market Areas and 2006-2008**

Company/Brand	Price (\$/12 oz)	Market Share	Weekly GRP	Calories (/12 oz)	Sugar (g/12oz)	Sodium (mg/12oz)	Caffeine (mg/12oz)
<b>Coca-Cola</b>							
Coke Regular	0.358	2.11%	111.2	140	39	50	35
Coke Diet	0.370	1.97%	72.6	0	0	40	47
Coke Zero Diet	0.409	0.31%	77.2	0	0	40	35
Sprite Regular	0.376	0.48%	56.8	144	38	70	0
<b>PepsiCo</b>							
Pepsi Regular	0.316	1.91%	114.6	150	41	30	38
Pepsi Diet	0.341	1.35%	66.8	0	0	35	35
Mountain Dew Regular	0.368	0.57%	74.5	170	46	65	54
Mountain Dew Diet	0.343	0.21%	57.6	0	0	50	54
<b>Dr. Pepper</b>							
Dr Pepper Regular	0.371	0.73%	135.9	150	40	55	42
Dr Pepper Diet	0.379	0.47%	58.8	0	0	55	42
Sunkist Regular	0.365	0.29%	13.4	190	50	70	40
7 Up Regular	0.326	0.31%	121.5	140	38	40	0

Notes: For each product we consider three bottle sizes: 12 ounces can, 20 ounces bottle, and 2 liter bottle, so there are 36 brand-size combinations in total. Seven DMAs include New York, Detroit, Washington DC, Chicago, Kansas City, Los Angeles, and Seattle.

**Table 2. Summary of Prices by Bottle Sizes and Top Shopping Locations**

Size/Shopping	Price (per ounce)	Unit Price	Percentage
<i>12 ounce can</i>			
JEWEL	0.018	0.214	4.42%
KROGER	0.020	0.236	3.90%
WAL-MART SUPER CENTER	0.019	0.233	2.93%
MEIJER	0.018	0.211	2.37%
COSTCO	0.022	0.265	1.96%
<i>20 ounce bottle</i>			
VENDING MACHINE	0.057	1.135	1.59%
WAL-MART SUPER CENTER	0.085	1.709	1.16%
WAL-MART	0.078	1.566	0.74%
TARGET	0.080	1.591	0.54%
SAFEWAY	0.087	1.736	0.51%
<i>2 liter bottle</i>			
KROGER	0.022	1.463	2.28%
WAL-MART SUPER CENTER	0.021	1.374	1.80%
SHOPRITE	0.020	1.369	1.79%
PATHMARK	0.020	1.358	1.75%
JEWEL	0.023	1.514	1.56%

**Table 3. Demand Estimation Results**

Variable	Mean Utility		Unobservables	
	Mean	Standard Errors	Mean	Standard Errors
Price	-5.971**	(2.974)	-5.201*	(2.814)
Advertising	1.914*	(1.033)	-2.740**	(1.170)
Calories	0.863**	(0.399)	2.579***	(0.527)
Sodium	-9.117***	(2.279)	3.247***	(0.962)
Caffeine	1.122***	(0.430)	-2.685***	(0.720)
Bottle Size - 20 ounces	-5.166***	(1.233)	2.867***	(0.903)
Bottle Size - 2 liters	-1.312***	(0.180)	-0.142	(1.132)
Coca-Cola	0.769**	(0.324)	1.195**	(0.581)
Pepsi	0.315	(0.258)	0.801*	(0.416)
Constant	-5.460***	(0.881)	-0.617	(0.501)
DMA Fixed Effects			Yes	
Month Fixed Effects			Yes	
Observations			5,580	
First State F Statistic			12.498	
P-value			0.000	
Hansen J Statistic			43.116	
p-value			0.381	

Note: Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Benchmarks: Bottle size: 12 ounces can. CSD company: Dr. Pepper. DMA: Seattle. Month: December. We define a market as a DMA x Month combinations and we have 155 markets in total. In total, we have 155 x 36 products (12 x 3 sizes) = 5,580 observations.



**Table 4. Own Price Elasticities**

Company	Brand	Bottle Size (oz)	Price Elasticities
Coca-Cola	Coke Regular	12	-1.023
		20	-4.183
		67	-1.178
	Coke Diet	12	-1.046
		20	-3.867
		67	-1.069
	Coke Zero Diet	12	-1.093
		20	-4.673
		67	-1.161
PepsiCo	Sprite Regular	12	-1.186
		20	-4.341
		67	-1.342
	Pepsi Regular	12	-1.044
		20	-4.042
		67	-1.050
	Pepsi Diet	12	-1.076
		20	-4.215
		67	-1.022
Dr. Pepper	Mountain Dew Regular	12	-1.125
		20	-4.404
		67	-1.128
	Mountain Dew Diet	12	-1.139
		20	-4.505
		67	-1.178
7 Up Regular	Dr. Pepper Regular	12	-1.141
		20	-4.620
		67	-1.146
	Dr. Pepper Diet	12	-1.134
		20	-4.578
		67	-1.140
Sunkist Regular	12	-1.204	
	20	-4.724	
	67	-1.370	
7 Up Regular	12	-1.187	
	20	-4.247	
	67	-1.291	

**Table 5. Price Elasticities of Demand for Selected CSDs**

Brand/ Company	Bottle Size (oz)	Coca-Cola						PepsiCo						Dr. Pepper					
		Coke Regular			Coke Diet			Pepsi Regular			Pepsi Diet			Dr. Pepper Regular			Dr. Pepper Diet		
		12	20	67	12	20	67	12	20	67	12	20	67	12	20	67	12	20	67
<b>Coca-Cola</b>	12	-1.023	0.017	0.017	0.018	0.017	0.017	0.018	0.017	0.017	0.018	0.017	0.017	0.018	0.018	0.017	0.017	0.018	0.016
Coke Regular	20	0.002	-4.183	0.002	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.002	0.003	0.002
	67	0.005	0.005	-1.178	0.004	0.005	0.005	0.005	0.005	0.006	0.005	0.004	0.006	0.005	0.005	0.005	0.004	0.005	0.005
	12	0.017	0.017	0.015	-1.046	0.016	0.017	0.017	0.017	0.015	0.017	0.016	0.015	0.018	0.019	0.017	0.018	0.019	0.015
Coke Diet	20	0.002	0.003	0.002	0.002	-3.867	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	67	0.004	0.004	0.004	0.004	0.004	-1.069	0.004	0.004	0.004	0.004	0.004	0.004	0.005	0.004	0.005	0.004	0.004	0.005
<b>Pepsi Co</b>	12	0.015	0.012	0.014	0.015	0.013	0.014	-1.044	0.015	0.015	0.016	0.015	0.015	0.013	0.012	0.011	0.013	0.013	0.010
Pepsi Regular	20	0.001	0.001	0.001	0.001	0.002	0.001	0.002	-4.042	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.002	0.001
	67	0.006	0.005	0.008	0.005	0.007	0.006	0.006	0.007	-1.050	0.006	0.006	0.008	0.005	0.004	0.004	0.004	0.006	0.004
	12	0.011	0.010	0.010	0.011	0.010	0.010	0.012	0.011	0.011	-1.076	0.012	0.010	0.010	0.010	0.008	0.011	0.011	0.008
Pepsi Diet	20	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-4.215	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	67	0.004	0.003	0.004	0.003	0.004	0.004	0.004	0.004	0.005	0.004	0.003	-1.022	0.003	0.003	0.003	0.003	0.004	0.003
<b>Dr. Pepper</b>	12	0.006	0.006	0.006	0.007	0.006	0.007	0.006	0.006	0.005	0.006	0.005	0.006	-1.141	0.009	0.010	0.007	0.007	0.009
Dr. Pepper Regular	20	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-4.620	0.001	0.001	0.001	0.001
	67	0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.002	0.002	0.002	0.001	0.002	0.003	0.003	-1.146	0.002	0.002	0.004
	12	0.004	0.004	0.003	0.004	0.003	0.004	0.004	0.004	0.003	0.004	0.003	0.003	0.005	0.005	0.005	-1.134	0.005	0.005
Dr. Pepper Diet	20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	-4.578	0.000
	67	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.002	0.001	-1.140

**Table 6. Estimated Market Shares Under Alternative Policy Scenarios (%)**

Brand/Company	Bottle Size (oz)	S0: Benchmark	S1: All GRP = 0	S2: Sales Tax of 1 Cent Per Ounce	S3: Restricted Calorie Content	S4: No 2-Liter Size Bottles
<b>Coca-Cola</b>	12	1.650	1.382	1.573	1.321	1.827
Coke Regular	20	0.054	0.042	0.050	0.041	0.058
	67	0.404	0.324	0.378	0.325	-
Coke Diet	12	1.535	1.257	1.437	1.594	1.689
	20	0.055	0.040	0.050	0.056	0.060
	67	0.380	0.293	0.349	0.403	-
Coke Zero Diet	12	0.220	0.179	0.198	0.228	0.252
	20	0.011	0.009	0.010	0.011	0.012
	67	0.075	0.065	0.067	0.082	-
Sprite Regular	12	0.333	0.310	0.310	0.264	0.381
	20	0.014	0.013	0.013	0.009	0.015
	67	0.134	0.127	0.124	0.104	-
<b>PepsiCo</b>	12	1.324	1.033	1.250	0.919	1.456
Pepsi Regular	20	0.036	0.024	0.034	0.023	0.037
	67	0.547	0.450	0.517	0.397	-
Pepsi Diet	12	0.970	0.871	0.907	1.002	1.067
	20	0.025	0.021	0.023	0.026	0.027
	67	0.353	0.324	0.328	0.365	-
Mountain Dew Regular	12	0.428	0.384	0.400	0.247	0.497
	20	0.017	0.015	0.016	0.009	0.018
	67	0.124	0.114	0.114	0.077	-
Mountain Dew Diet	12	0.143	0.124	0.133	0.147	0.161
	20	0.006	0.005	0.006	0.007	0.007
	67	0.058	0.049	0.053	0.058	-
<b>Dr. Pepper</b>	12	0.536	0.396	0.508	0.360	0.603
Dr. Pepper Regular	20	0.017	0.011	0.015	0.011	0.018
	67	0.177	0.133	0.168	0.110	-
Dr. Pepper Diet	12	0.335	0.342	0.313	0.360	0.373
	20	0.009	0.008	0.008	0.009	0.009
	67	0.127	0.128	0.118	0.142	-
Sunkist Regular	12	0.175	0.208	0.161	0.066	0.212
	20	0.006	0.007	0.006	0.003	0.007
	67	0.104	0.119	0.095	0.051	-
7 Up Regular	12	0.192	0.143	0.175	0.126	0.214
	20	0.005	0.004	0.005	0.003	0.006
	67	0.109	0.088	0.099	0.075	-
Total Regular CSDs		6.386	5.328	6.011	4.541	5.350
Total Diet CSDs		4.304	3.716	4.003	4.489	3.656
Total CSDs		10.690	9.044	10.014	9.030	9.006
Change of Total CSDs		-	-15.40%	-6.32%	-15.52%	-15.75%
Outside Goods		89.310	90.956	89.986	90.970	90.994