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Memorandum

To: Steve Klein, Chief Fiscal Officer, Joint Fiscal Office

From: Tom Kavet

CC: Sara Teachout, JFO

Date: March 9, 2015

Re: H.235 Revenue Estimates

Background

As requested, I have reviewed the proprietary source data, assumptions and methodological approaches described in the attached memo (Appendix A, herein), estimating State revenue impacts associated with H.235 by Dr. Tatiana Andreyeva, Director of Economic Initiatives at the Rudd Center for Food Policy and Obesity, and Associate Professor of Agriculture and Resource Economics at the University of Connecticut. The use of an external source in estimating revenue impacts was based on the paucity of publicly available information with which to make these estimates and access to relevant proprietary Vermont store sales data from Information Resources, Inc. (IRI)[1] and other source data made available through the Rudd Center.

After signing a confidentiality agreement with IRI, I was provided with full access to all data, assumptions, models and inputs associated with the estimates made by Dr. Andreyeva. I found both the data and ensuing analysis to be credible and thorough. Dr. Andreyeva has performed extensive prior peer-reviewed work in this field and is among the leading academic researchers and analysts of this subject matter.[2] Her revenue estimates include both point estimates and discussion of possible ranges around areas of uncertainty.

These areas include both demand responses to retail price changes and estimates of sales not covered by IRI survey-based data. Because the sugar-sweetened beverage (SSB) tax has only been implemented recently and in relatively small political jurisdictions, there is scant history on observed tax impacts in the U.S.. In response to

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[1] As detailed in the attached memo from Dr. Andreyeva, IRI collects data from point-of-sale store scanners for resale to both manufacturers and retailers so as to, as described on their website, "analyze shopper activity, make micro- and macro-level decisions, collaborate on new initiatives as well as create innovative new products, packaging, pricing, promotion and merchandising strategies." It is our understanding that access to Vermont-specific data cost approximately $11,000. For more information on IRI, see: http://www.iriworldwide.com/About.aspx

[2] See, for example, authored publications at: http://are.uconn.edu/faculty_tatianaandreyeva_2_1457596438.pdf

this, Dr. Andreyeva estimated both a "Base Scenario," using midpoints of key model assumptions, and a "Conservative Scenario," in which she used lower boundaries for key model assumptions (see Appendix A, page 6).[3] The model ranges around the "Base Scenario" are approximately plus or minus $7 million per year. While we concur with the model estimates made for these scenarios, given the unknowns associated with this new tax, we believe an appropriately conservative revenue estimate would be between the Base and Conservative cases, per the below table.

Revenue Estimates

As depicted in the below table, expected revenues based on the 2 cent per ounce tax outlined in H.235 will total about $30.5 million in FY16, on a full fiscal year basis, with only moderate growth expected over the next five years. The slow future nominal revenue growth is a function of continued declines in fountain and vending machine purchases, offset by increases in grocery and other store purchases. These revenue components are presented in more detail in the attached memo in Appendix A.

SSB Tax (full year)	Total Revenue ($Millions)	%CHYA	Rate = 2 cents per oz.
FY16	$30.5		
FY17	$30.9	1.1%	
FY18	$31.2	1.0%	
FY19	$31.6	1.3%	
FY20	$32.0	1.4%	

As outlined in Appendix B, Depending upon final implementation language in the bill and Tax Department administrative and collection procedures, FY16 revenues are likely to be at least $2.5 million below the above estimate, and if delayed a full quarter, could be as much as $7.5 million below the above estimate. Initial Tax Department estimates put administrative and collection costs at about $430,000 per year, with a first year one time additional cost of about $500,000 (see Appendix B). When final Tax Department implementation timing and marginal administrative costs are ascertained, we will adjust the above revenue estimates accordingly.

It should also be noted that some of the source data used in the Rudd Center revenue estimates are scheduled to be updated in the near future. If/when such updates occur, and if significant, we will update the revenue estimates herein.

[3] Despite the Rudd Center's advocacy in favor of legislation such as H.235, there did not appear to be any bias in their revenue estimation process. If revenues are higher, this could be considered an incentive for a state to adopt such a measure, but would also indicate a reduced health benefit, since this requires consumption demand to be relatively inelastic. If revenues are lower, this would be indicative of better health outcomes (unless most of this was due to out-of-state purchases), but would remove some of the fiscal benefit of the tax. This is analogous to the tobacco tax in its dual purpose.

APPENDIX A

External Rudd Center Analysis and Revenue Estimates
Prepared With JFO Oversight by Tatiana Andreyeva, PhD,
Rudd Center for Food Policy and Obesity,
University of Connecticut, March 5, 2015

Tax Revenue Projections:
Excise Tax on Sugar-Sweetened Beverages (SSB) in the State of Vermont

Tatiana Andreyeva, PhD
Rudd Center for Food Policy and Obesity
University of Connecticut

March 5, 2015

This brief describes data and methodology for developing SSB tax revenue estimates for the state of Vermont. This work is based on the methods used in developing the Rudd Center calculator (1,2), which were further extended in collaboration with Thomas E. Kavet. The projections are on an annual basis for 2015 through 2019. The analysis is based on multiple assumptions and data sources described in detail below.

DATA AND ASSUMPTIONS

Beverage Sales/Prices in Food Stores

Proprietary data on beverage sales and prices in VT food stores were licensed from Information Resources Inc (IRI). IRI collects data via the InfoScan Tracking Service, which is a business reporting service that tracks point-of-sale scanner sales and promotional activity for grocery, drug, and mass merchandiser stores in the U.S. Manufacturers, retailers, sales and marketing agencies, and financial institutions use InfoScan data for brand, category, promotional, and industry trend analyses. IRI is a leading market company that receives market content from 95,000 retail locations in the US and Europe. In addition to point-of-sale data that retailers provide to IRI, the company projects sales for retailers that do not provide data. IRI collects data at the product/Universal Product Code (UPC) level with a substantial level of detail on product and sales. More information about IRI is available elsewhere (3).

To reduce the cost of data for this project, IRI has aggregated UPC level data to category totals. For all types of non-alcoholic beverages, IRI was requested to only include products with added sugar/caloric sweeteners that provide at least 5 calories per serving. Beverages with fewer than 5 calories per serving and 100% fruit juice were excluded. IRI has the following information on all products, which were used to make the requested selection: Manufacturer, Parent Company, Brand, Caffeine Info, Calorie Level, Flavor/Scent, Pack Type, Package, Percentage of Juice, Product Type, Total Count, Total Ounces, Total Pack Count, Type of Sweetener, Additives, Carbonation, Process, and Type of Water.

For the state of VT in a calendar year of 2014, the following beverage types were provided:

1. Carbonated Soft Drinks (CSD)
2. Sports Drinks

3. Tea/Coffee Ready to Drink
4. Aseptic Juices
5. Bottled Juices – Shelf Stable
6. Canned Juices – Shelf Stable
7. Bottled Water
8. Energy Drinks
9. Juice/Drink Concentrate
10. Juices – Frozen
11. Refrigerated Juices/Drinks
12. Refrigerated Teas/Coffee

For each of these beverage categories, IRI provided custom totals of Dollar Sales, Unit Sales, Volume Sales (Ounces), and Average Price per Ounce for 3 markets separately, including: Multi-outlet, Food, and Convenience. Food is also known as Grocery Outlet and is included in the Multi-outlet segment. Adding Convenience to Multi-outlet gives the Total retail market in the IRI data. Retailers not available in the IRI data are discussed below.

1. Multi-outlet includes the aggregation of the following food stores:

   Grocery Outlet – Stores with annual sales of $2MM or more
   Drug Outlet– All chain and independent drug retailers, excluding prescription sales
   Mass Merchandiser Outlet – Includes census chains: Target, Kmart, Shopko
   Census Walmart – Census data from Supercenters, Division 1 and Neighborhood Market
   Census Club – BJ's, Sam's Club chains only
   Census Dollar – Dollar General, Family Dollar, Fred's chains only
   Census Military –Defense Commissary Agency (DeCA)

2. Food includes the aggregation of projected and non-projected data for chain and independent grocery stores, including smaller independents. IRI collects data from a sample of independent stores and projects up to account for the others within this geography.

3. Convenience includes the aggregation of projected and non-projected data for chain and independent convenience stores.

Not included by IRI: IRI does not have data on sales in vending machines, restaurants/fast food outlets (i.e. fountain drinks), and internet orders.

In addition, some food stores do not provide point-of-sales data to IRI, so their sales are not counted in the IRI data. These retailers include small groceries (under $2MM annual sales); dollar stores other than Dollar General, Family Dollar, and Fred's chains; club stores other than BJ's and Sam's Club (e.g., Costco). We make an adjustment for the unobserved by IRI market segment as discussed below.

Beverage Sales/Prices in Other Channels: Fountain Drinks/Vending

Sales of fountain drinks (restaurants, fast food outlets) typically apply to soft drinks only. Other sugary beverages (e.g., energy drinks) are sold as packaged beverages, and were assumed to have zero sales for the fountain drink segment.

Data on sales of fountain drinks were obtained at the regional and national level from the Beverage Marketing Corporation (BMC). VT is part of the Northeast region in the BMC data, which also includes NY, MA, ME, RI, DE, DC, CT, NH, PA, and NJ (4). All states in the region are assumed to have the same per capita sales. Per capita purchases of non-diet fountain drinks were calculated based on the latest regional per capita sales of fountain soft drinks (2011), adjusted for an annual reduction of 2.2% (5), and excluding diet fountain drinks based on their share in total fountain drink sales in the US (4).

Average prices of fountain drinks were not available for VT. These were based on data from a national survey of food outlets by Bridging the Gap (6), adjusted for inflation in 2012-2015 (7).

Based on the US share of 12.7% of total soft drinks sold in vending in 2012 (8), per capita sales of soft drinks in vending were calculated from the regional per capita sales of non-diet soft drinks. No public information was available on vending sales of beverages other than soft drinks and bottled water (US share in vending was 8.3%, 9). The share of vending sales for other beverages but soft drinks was assumed to equal 5% of measured IRI sales. Prices in vending were assumed to equal average prices in convenience stores from the IRI data.

Other Data and Assumptions

State population data for 2014-2019 were provided by the Vermont Joint Fiscal Office (JFO), based on official consensus State JFO and Administration forecasts as of December 2014. For 2014, the U.S. Census Bureau estimates the Vermont resident population at 626,562. Population growth for 2015-2019 was incorporated in the model, and varied from 0.14% to 0.22% annually.

All customers were assumed to be subject to the same tax rate. No exceptions were expected for any SSB purchases, including those made using SNAP benefits (currently not subject to state sales taxes).

Price elasticity of demand for SSBs is assumed to be -1.0 in the base estimation scenario. This is the middle point of the summary estimates for soft drinks and other SSBs in the recent literature, which vary between -0.79 (10) to -1.21 (11). The most recent meta-review on the effect of fiscal policy interventions to improve diet examined 11 systematic reviews of 533 individual studies, and concluded that soft drink taxes would reduce consumption by at least the same percentage as the tax rate (12). The proposed default elasticity is also equivalent to the average price elasticity of -1.08 for demand analysis of SSBs only (11).

Tax pass rate. Producers and retailers are assumed to pass the tax fully on consumers, i.e. 100% pass rate. It is possible that the tax is over- or under-shifted depending on strategic behavior among manufacturers and/or retailers and the relative elasticities of supply and demand. Over-shifting implies that a tax-induced price increase is greater than the actual tax leading to a larger drop in consumption and tax revenues compared to a fully-passed tax. Under-shifting is the opposite effect of a lower price increase, a lower reduction in consumption and higher tax

revenue (2). Prior evidence on sales taxes and especially excise alcohol taxes indicate tax over-shifting (13-15). Data for cigarette excise taxes suggests either a full pass through or some over-shifting as producers in a highly concentrated market use this as an opportunity for a coordinated price increase that raises prices by the tax or more (16).

We assumed that prices of diet varieties remain unchanged, although in practice, bottlers and/or retailers could set the same or similar prices on both types of beverages or use other strategies to counteract the tax (2).

Trends in Beverage Sales projections for 2014-2019 are based on the U.S. beverage market trends in 2011-2013, which we estimated based on total U.S. beverage volume sold by type from the Beverage Marketing Corporation (5). No historic data on beverage sales in VT were available. Soft drinks and fruit drinks were assumed to continue a gradual decline in sales irrespective of fiscal policy interventions (2.2% and 1.6% per year respectively). The other beverages (sports drinks, RTD tea/coffee, energy drinks, and sweetened waters) were expected to continue strong growth, from 2.5% to 6.4% annually.

Price inflation is based on Consumer Price Index (CPI) for the category of juices and nonalcoholic beverages. The average annual rate of price change over 2010-2015 was 0.456% (7), which is used to project price increase for all types of beverages. The inflation rate is assumed to be constant over time (2015-2019). Inflation-adjusted beverage prices remain constant over time, assuming no external price shocks such as a large increase in commodity prices. We further assumed a constant nominal value of the tax that meant a somewhat smaller impact of the tax in future years.

Uncertainty adjustment: To account for incomplete data on all food retailers in the IRI data, we used two approaches to estimate the unobserved segment of beverage sales and adjust revenue estimates upward.

We compared per capita SSB sale estimates for the U.S. and VT using the BMC data (4,5) and IRI data. For the main category, non-diet soft drinks, this comparison suggested about a 30% difference (15.7 and 10.9 gallons per capita respectively). Another approach to estimate the proportion of likely missed sales in the IRI data was based on the analysis of the beverage market composition, which suggested similar results.

We have adjusted IRI measured sales by 30% upward for all beverage types. This is assumed to capture uncertainty about unobserved sales and prices not available through IRI. It is unknown how accurately this reflects the reality due to possible differences in the measurement and product definition across commercial providers (IRI vs. BMC) as well as potential differences in VT vs. U.S. average per capita SSB purchases. The estimates could be plus or minus about $5-7 million, depending upon elasticity assumptions and uncovered sales in the IRI data.

RESULTS

Table 1 shows revenue estimates from the baseline estimation of imposing a 2 cent/oz tax on sugar-sweetened beverages (5 or higher calories per serving). Table 2 provides details on revenue by channel.

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Table 1. Projected Annual SSB Tax Revenue by Calendar and Fiscal Year
State of Vermont, $
Rate = 2 cents per Ounce

CY2015	33,658,172	FY2016	33,820,975
CY2016	33,983,777	FY2017	34,174,106
CY2017	34,364,434	FY2018	34,568,017
CY2018	34,771,600	FY2019	34,992,796
CY2019	35,213,992	FY2020	35,449,760

Table 2. Projected Annual SSB Tax Revenues by Retail Channel
State of Vermont, $
Rate = 2 cents per ounce

	Calendar Year				
Channel	**2015**	**2016**	**2017**	**2018**	**2019**
Food Stores: IRI Measured	18,704,026	19,055,125	19,442,565	19,850,661	20,284,581
Fountain Drinks	5,321,829	5,226,295	5,134,460	5,041,661	4,948,996
Vending	4,021,109	3,985,820	3,954,639	3,924,079	3,895,040
Food Stores: Unmeasured IRI	5,611,208	5,716,537	5,832,770	5,955,198	6,085,374
Total	**33,658,172**	**33,983,777**	**34,364,434**	**34,771,600**	**35,213,992**

APPENDIX:

To address uncertainty about the price elasticity of demand for SSBs and unmeasured food store market in the IRI data, we consider an additional conservative scenario where the price elasticity is set to -1.2 (vs. -1.0 in the base scenario) and the unmeasured market is assumed at 20% (vs. 30% in the base scenario). The higher price sensitivity is to account for possible tax avoidance and shifts in normal purchases via for example cross-border shopping or internet orders. The lower share of unmeasured market assumes lower sales in order not to overestimate the tax base.

As a comparison, we have provided tax revenue estimates for a penny-per-ounce SSB tax.

Table 3 presents a summary of estimates by tax rate and projection scenario.

Table 3. Projected Annual Tax Revenues by Tax Rate and Projection Scenario

Rate 2c/oz							
Base Scenario				**Conservative Scenario**			
CY2015	$ 33,658,172	FY2016	$ 33,820,974	CY2015	$ 26,917,913	FY2016	$ 27,259,712
CY2016	$ 33,983,777	FY2017	$ 34,174,105	CY2016	$ 27,601,512	FY2017	$ 27,601,512
CY2017	$ 34,364,434	FY2018	$ 34,568,017	CY2017	$ 27,601,512	FY2018	$ 27,794,579
CY2018	$ 34,771,600	FY2019	$ 34,992,796	CY2018	$ 27,987,645	FY2019	$ 28,195,255
CY2019	$ 35,213,992	FY2020	$ 35,449,760	CY2019	$ 28,402,865	FY2020	$ 28,620,904
Rate 1c/oz							
CY2015	$ 23,337,989	FY2016	$ 23,400,686	CY2015	$ 20,763,741	FY2016	$ 20,821,892
CY2016	$ 23,463,383	FY2017	$ 23,544,335	CY2016	$ 20,880,043	FY2017	$ 20,954,398
CY2017	$ 23,625,287	FY2018	$ 23,714,530	CY2017	$ 21,028,754	FY2018	$ 21,110,454
CY2018	$ 23,803,773	FY2019	$ 23,904,215	CY2018	$ 21,192,155	FY2019	$ 21,283,795
CY2019	$ 24,004,657	FY2020	$ 24,115,385	CY2019	$ 21,375,436	FY2020	$ 21,475,529

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APPENDIX B

Tax Department Communication to JFO Regarding H.235
Implementation Timing and Associated Administrative Cost Estimates

From: Morgan, Candace [mailto:Candace.Morgan@state.vt.us]
Sent: Monday, March 09, 2015 2:34 PM
To: Sara Teachout, JFO
Cc: Green, Devon
Subject: H.235 - Sugar-sweetened beverages

Hi Sara,

Attached you will find an updated memo about the implementation of a sugar-sweetened beverage excise tax, as proposed in H.235.

About your earlier call for a start date – we would be more comfortable with the first payment expected in September (as opposed to July). Of course the main reason for that is additional time for outreach and form creation. If this bill doesn't pass until the end of the session, July 1 does not allow for much turnaround time. A September 1 effective date for the tax would make more sense to us, with the first payment expected on September 15, 2015.

Please let me know if you have additional questions. The estimates are very rough in some places as it depends on our contracts with various vendors.

Thanks!
Candace

Candace Morgan

Director | Policy, Outreach, and Legislative Affairs
Vermont Department of Taxes

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Implementing the Sugar-Sweetened Beverage Tax
As proposed in H.235

Timeline
As drafted, the bill is effective July 1, 2015. It would be a challenge to begin collecting payments on July 15, 2015. We would prefer for the effective date to be September 1, with a first payment expected on September 15. Our internal development can happen quickly, but we will still need to notify businesses and give lead time. The distributors that we know file monthly with us for the malt and vinous beverage tax. However, they are not the only audience.

Registration Process
The proposed legislation asks for each distributor to obtain a license from the Department before selling sugar-sweetened beverages in the State. The process would be similar to how businesses need to register before collecting sales and use, meals and rooms, and withholding. Depending on the number of taxpayers, we would either handle it manually or by adding it to the functions in the Secretary of State's business registration portal. The second option would have some cost associated with it.

Revenue Processing
The Department will develop a reporting form to be paper-filed that includes the quantity of syrup, powder, and sugar-sweetened beverages subject to the excise tax. Registered distributors will access this form from the Department's website. One staff person in our Taxpayer Services Division will be necessary to address questions and review filings with errors. Distributors will file and pay on paper for the first two years.

ANNUAL COST: $100,000 (1 FTE)

Accounting and Data Integration
The receipt of a payment from a distributor must be matched with the distributor's account as well as the state's revenue accounts. All of the information from the transaction is stored in a form that allows for accounting and auditing purposes. The Department is developing a new system, VTax, for all tax types. This excise tax will be included in Phase 4 (2017) of this new system.

ANNUAL COST: $100,000 (maintenance)
SYSTEM INTEGRATION: $500,000 (one-time cost, FY17)

Billing and Collections
Inconsistency in reporting from distributors is one condition that could lead to a field audit of records to ensure that the volumes reported by distributors are consistent with the inventory of purchases and sales. Another level of enforcement is to ensure that retailers are only purchasing from registered distributors. There is no current database that will allow for data matching leading to early enforcement activities. Rather, field auditors will be necessary to check on retail establishments for their records related to the purchase of sugar-sweetened beverages. There are several thousand retailers in Vermont and an unknown number of potential distributors.

ANNUAL COST: $200,000 (field auditors)

Policy Support
The Department will need to develop reporting forms, regulations, and maintain staffing capacity to address questions that arise throughout the time when the new tax is being implemented.

ANNUAL COST: $30,000 (.3 FTE)