Presenter Disclosure Information

Lisa M. Powell, PhD

*Impacts of Policy and Environment on Consumer Health Behaviors*

**FINANCIAL DISCLOSURE:**
No relevant financial relationship exists
Presentation Overview

- Trends
- Soda Taxes, Consumption and Weight Outcomes
- Policy Implications
Background: Consumption Patterns
U.S. Sugar-Sweetened Beverage Consumption, by Age 2007-2008

Source: National Health and Nutrition Examination Survey (NHANES) 2007-2008, author’s own calculations
SSB Consumption among Children & Adolescents, 1999-2008

Trends in Food and Beverage Prices
Selected Food Price Trends, 1980-2010
Inflation Adjusted

Background: Economic Tool Box
The economic framework assumes that individuals maximize utility (i.e., happiness) subject to time and budget constraints.

Prices and wages

Constraints
- Budget
- Time
Economic Models

- Idea is that the policy instrument changes relative costs or benefits which, in turn, affect behavior choices related to diet and activity.

- Equity considerations: i.e., soda taxes - who benefits versus who bears the costs.
  - Health benefits – progressive
  - Tax burden – regressive
  - Subsidies – progressive
Prices and Consumption
Price Effects on Consumption

- A recent review of studies on the impact of food and beverage prices on consumption of various products; estimates suggest 10% own-price increase would reduce:
  - Soft drink consumption by 7.8%
  - Food away from home consumption by 8.1%

- USDA study on SSB and other beverage consumption estimates that a 10% price increase in SSB prices would result in the following changes in consumption:
  - Own-price effect:
    - SSBs: -12.6%

Sources:
Soda Taxes: Consumption & Weight Outcomes

Objectives, Data and Models
Objectives

• To empirically examine the associations of state-level soda taxes with consumption and weight outcomes, using national data sets including:
  • A.C. Nielsen Homescan Data
  • Early Childhood Longitudinal Study-Kindergarten Cohort (ECLS-K)
  • National Longitudinal Survey of Youth 1997 (NLSY97)
Tax Data

• State level soda taxes from Bridging the Gap (BTG)

• Linked by state FIPS codes and year

• Measures used:
  • State-level soda tax rate
    ➢ Disfavored dichotomous indicator (indicator if disfavored tax rate >0)
    ➢ Disfavored tax rate (soda tax rate – general food tax rate)
  • State-level additional soda taxes/fees (dichotomous indicator)
Soda Taxes and Consumption

A.C. Nielsen Homescan Data
Objective
• To examine the association of soda taxes with household soda purchases

Data Description
• Cross-section of household purchase information based on scanner data from a variety of stores, 2nd Q 2007
• Household demographic data
• Final sample includes 66,211 non-military households
• Outcome variable: soda volume in ounces of carbonated beverages purchased per household over the sample period (m=566 ounces ~ 2 cases of 12 oz cans)
• Control variables: household income, size, race, educational attainment, presence of children/age, female head of household employment status, and census regions
Policy Simulation Example: Household Regular Soda Purchases

- Study results imply very small tax elasticities for purchases of -0.06.

- If all states increased sales taxes to the maximum tax rate of 7% (an increase of 60.6% from the current sample mean of 4.36%), household purchases of regular soda are estimated to be 3.6% lower.

- Consider the imposition of a new 20% tax → assuming constant elasticity, household regular soda purchases are estimated to be 27.5% lower.

  - The extent to which this applies to all regular soda consumption depends on constant elasticity noted above, and whether regular soda consumed away-from-home is similarly price/tax responsive.

Source: Loudermilk, Powell, Chriqui, and Chaloupka, 2011
Soda Taxes, Children’s Consumption, and Weight

Early Childhood Longitudinal Study-Kindergarten Cohort
Objective

• To examine association between soda taxes, consumption and weight of children

Data Description

• Nationally representative panel of elementary school students
• Food consumption 5th grade; measured height and weight
• Final sample: 7,414 children who reported their food consumption and 7,300 children for which height and weight information exists
• Outcome variables: soda consumption in last week (m=6), soda purchases at school (m=0.4), and weight change 3rd to 5th grade (m=1.9)
• Control variables: age in months, race/ethnicity, family income, mother’s education level, physical activity, TV watching, parent-child interactions
Policy Simulation Example: Children’s BMI

• Assuming a constant elasticity, an 18% differential soda tax would correspond to a -0.23 BMI units in the change in BMI between 3rd and 5th grade, or a 20% in the excess BMI gain.

Source: Sturm, Powell, Chriqui, and Chaloupka, *Health Affairs*, 2010
Soda Taxes and Adolescents’ Weight

National Longitudinal Survey of Youth 97
Objective

- To examine association of soda taxes with youths’ BMI using cross-sectional and longitudinal models

Data Description

- Estimation sample includes 18,029 person-year observations living at home
- Information on parental characteristics available from parental questionnaire and annual household roster data
- Outcome variable: weight status: BMI and overweight prevalence
- Control variables: age, gender, race, ethnicity, income, mother’s education, mother’s employment status
- Neighborhood controls: median household income
Longitudinal Regression Estimates of the Determinants of Adolescent BMI

<table>
<thead>
<tr>
<th></th>
<th>BMI</th>
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</thead>
<tbody>
<tr>
<td>Continuous disfavored state soda tax rate</td>
<td>-0.220**</td>
</tr>
<tr>
<td>Presence of additional state soda taxes/fees</td>
<td>-0.230***</td>
</tr>
</tbody>
</table>

Source: Powell & Chriqui, in progress, 2011
Summary of Empirical Results

• Generally moderate associations between soda taxes and body weight based on the existing low tax rates which range up to just 7% in the study sample.

• *Substantial* increases in soda tax rates may have some measureable effects on BMI and even greater effects at the population level.

• Disfavored soda tax elasticity of BMI is estimated to be -0.029.
  ➢ Doubling the disfavored tax rate (~3% to ~6%) is estimated to reduce BMI by 2.9%.

Source: Powell & Chriqui, in progress, 2011
Policy Implications
Sales Taxes on Selected Beverages, **Taxing States** (as of July 1, 2011)

**Note:** Three states also impose a mandatory statewide local tax that is not reflected in the above data: CA (1%), UT (1.25%), VA (1%).
State Regular, Sugar-Sweetened Soda Sales Tax Rates (as of July 1, 2011)

Note: Does not include 3 states with mandatory, statewide local tax rate (CA-1%, UT-1.25%, VA-1%)

Sales Tax Rate
- 0 (16 states)
- >0.40-0.49 (9 states)
- >0.49-0.60 (15 states)
- >0.60-0.69 (7 states)
- >=0.70 (4 states)

Data Source: Bridging the Gap Program, University of Illinois at Chicago, 2011
Selected Examples of State SSB-related Legislative Activity 2011/12

- **California** ($0.01/ounce tax on tax on distributors of SSBs; revenue to create Children’s Health Promotion Fund) – Held (failed to pass) in Committee 9/23/2011

- **California** (to authorize any county or city to propose to voters a $0.01/ounce excise tax on SSBs) – Died in Committee 2/9/2012

- **Hawaii** ($0.01 per teaspoon tax on SSBs; revenue to community health centers and trauma system special funds)

- **Illinois** ($0.01/ounce tax on SSBs; revenue to create Illinois Health Promotion Fund)

- **Nebraska** (sales tax on SSBs; revenue to Obesity Prevention Fund)

- **Rhode Island** ($0.01/ounce, revenue to funds programs to reduce obesity)

- **Tennessee** ($0.01/ounce tax on bottled SSBs in exchange for 1% reduction in state sales tax on food – referred to as ‘swap legislation’)

- **Vermont** ($0.01/ounce tax on SSBs; revenue to create Vermont oral health improvement fund)

- **West Virginia** (series of taxes on bottled soft drinks, syrups and dry mixtures; revenue for construction, maintenance and improvements of state parks)

Source: Rudd Center for Food Policy & Obesity, Legislation Database
Tax Policy Design Implications

• Implications for Potential Impact on Health Outcomes
  ❖ Issues of applicability to SNAP purchases
  ❖ Excise tax rather than a sales tax
    ➢ Incorporated at shelf price
    ➢ Applicable regardless of where items are sold
    ➢ Applied on a per unit basis rather than a function of price so that quantity discounts are still taxed. *Issue of zero marginal cost for free refills.*
    ➢ But need to adjust for inflation
  ❖ Dedication of tax revenue to nutrition and physical activity programs
SSB Taxation & Revenues

- Revenue generating potential of tax is considerable
  - SSB Tax calculator at:
  - Tax of one cent per ounce could generate:
    - $15.1 billion nationally if on SSBs only
    - $24.4 billion if diet included
  - Tax of one cent per ounce in Illinois
    - $601.7 million, SSBs only
    - $871.0 million if diet included
  - Earmarking tax revenues for obesity prevention efforts would add to impact of tax
Non-tax SSB-related Policies
Additional Policies Aimed at Reducing Sugar-Sweetened Beverage Consumption

- School and worksite restrictions on availability
- Other school policies related to standards for competitive foods
- Zoning policies
- Menu labeling
- Advertising restrictions
- Public Service Announcements
Resources and Contacts
For more information: www.bridgingthegapresearch.org

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Institute for Health Research and Policy, UIC
http://www.ihrp.uic.edu

Bridging the Gap
http://www.bridgingthegapresearch.org

Contact: powelll@uic.edu
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