Evaluation of the Barbados Sugar Sweetened Beverage Tax

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Context for SSB tax in Barbados

Baseline obesity rates
Barbados has high obesity rates – in 2012, 74% of women were overweight (43% obese) and 66% of men (23% obese)

Sugary drink consumption levels
The Caribbean has been estimated to have the highest sugary drink consumption of any region in the world with an estimated 1.9 servings of sugary drinks consumed per person each day.

(Jou & Techakehakij 2012)
Defined SSBs as: “...carbonated soft drinks, juice drinks, sports drinks, fruit juices and others particularly those which fall under tariff headings 20.09 and 22.02 on the import side, and similar products of like standing produced within Barbados that contain added high calorie sweeteners...”
Summary of Barbados SSB Tax
Evaluation overview

1. Political Process
2. Public Acceptability of tax
3. Price Change Analysis
4. Sales Trends Analysis
5. Baseline consumption of SSBs
6. Potential analysis of post-tax diet
7. Model long term health effects
8. Revenue estimation/summary
9. Create regional manual

(Mytton, 2014)
Price Change Analysis - Data

Weekly price data on beverages from a local grocery store from January, 2012-March, 2016

<table>
<thead>
<tr>
<th>Broad Category</th>
<th>Specific Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSBs</td>
<td>Soda, Sweetened Juice, Energy &amp; Sports drinks, Other Sweetened Beverages</td>
</tr>
<tr>
<td>Non-SSBs</td>
<td>Diet Soda, Non-sweetened Juice, Water</td>
</tr>
</tbody>
</table>
Price Change Analysis - Methods

- Used a least squares linear regression model
- Calculated cost per litre per month for each product
- Estimated the proportional change in price per litre using July 2015 as the denominator
- Used 51 month indicators, with July 2015 as the reference
- Fixed effect on each product
- Sensitivity analysis varied reference month to Jan and April 2015

\[
\frac{Price}{Price_{ref}}
\]
Results

The introduction of the 10% tax was associated with a 6.3% increase in the price of sugary drinks, and no significant change in price of non-SSBs.
Results

Sweetened Juices

Energy & Sports Drinks

Soda

Other Sweetened Drinks
Results
## Results

<table>
<thead>
<tr>
<th>Category</th>
<th>Estimate</th>
<th>Lower</th>
<th>Upper</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-SSBs</td>
<td>1.6</td>
<td>-0.7</td>
<td>3.9</td>
<td>0.161</td>
</tr>
<tr>
<td>SSBs</td>
<td>6.3</td>
<td>5.6</td>
<td>7.1</td>
<td>0.000</td>
</tr>
<tr>
<td>Diet Soda</td>
<td>-0.9</td>
<td>-2.6</td>
<td>0.8</td>
<td>0.313</td>
</tr>
<tr>
<td>Energy &amp; Sports Drinks</td>
<td>7.4</td>
<td>5.5</td>
<td>9.2</td>
<td>0.000</td>
</tr>
<tr>
<td>Non-sweetened Juices</td>
<td>3.5</td>
<td>-0.2</td>
<td>7.1</td>
<td>0.063</td>
</tr>
<tr>
<td>Other Sweetened Drinks</td>
<td>3.4</td>
<td>-1.6</td>
<td>8.4</td>
<td>0.181</td>
</tr>
<tr>
<td>Soda</td>
<td>7.5</td>
<td>6.2</td>
<td>8.8</td>
<td>0.000</td>
</tr>
<tr>
<td>Sweetened Juices</td>
<td>5.2</td>
<td>4.2</td>
<td>6.1</td>
<td>0.000</td>
</tr>
<tr>
<td>Water</td>
<td>-0.8</td>
<td>-3.4</td>
<td>1.8</td>
<td>0.552</td>
</tr>
</tbody>
</table>
Challenges

• Limited access to price data from a more representative range of stores
  • Adding an additional types of stores in future analysis

• Limited availability of household consumption data

• Quick turn around between announcement of the tax and implementation made it difficult to collect pre-tax price data from various sources
Discussion

How do these results compare to findings in other countries?

• In Mexico, Grogger and Colchero found price of sodas increased by more than the tax, and other SSBs were similar to Barbados

• In Berkeley, Falbe found similar changes in prices
Next steps

Analyze price change and sales:
- Access data from diverse stores in Barbados
- 18 months of post-tax data
- Data from a comparable grocery chain in Trinidad
- A non-beverage product as a control
- Interrupted time series analysis/ difference-in-difference
- Look at availability of products over time
Next Steps

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(Mytton, 2014)
Mexico: Case Study

Context: High obesity, high diabetes, high sugary drinks

Tax: ~10% tax on SSBs (including syrups, concentrates, powders)

Effect: 6% reduction in all SSBs
Mexico: Case Study

What did they do?
1. Higher pass through rate
2. Mass media campaign led by advocacy groups (print, video, radio, billboards, etc)

Messages like:

“Would you drink 12 tablespoons of sugar? Sodas are sweet, diabetes isn’t.”

“What’s more important, public health or soda industry interest?”
Mexico: Case Study

What did they do?

3. Demonstrations led by advocates

4. Still pushing for a 20% tax

5. Although no earmarked revenue, they did end up allocated some money to water fountains and water at schools
Conclusions

The 10% SSB excise tax seems to be associated with a statistically significant 6.3% increase in the price of sugary drinks, and no change in the price of other drinks.

Companies appear to have absorbed some of the tax, so consumers do not see the full 10% price signal at the checkout counter.

Additional publicity and messaging around the tax and health impacts of sugary drinks may increase its effectiveness.
Many thanks

- SSB Evaluation Steering Committee
- Local grocery store partner
- Ministry of Health and Ministry of Finance
- Healthy Caribbean Coalition
- Dr. Jean Adams and Dr. Nigel Unwin
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