Using Fiscal Policy to Prevent Non-Communicable Diseases

Frank J. Chaloupka, University of Illinois at Chicago
School of Public Health, University of Illinois at Chicago
10 February 2017, Chicago, Illinois
Overview

• Health & Economic Impact of Non-Communicable Diseases
• Impact of Tobacco, Alcohol, and Sugary Beverage Taxes on Use and Consequences of Use
• Myths and Facts About Economic Impact of Taxes

www.tobacconomics.org
Health & Economic Impact of NCDs
Leading Causes of Death Globally

- Cardiovascular diseases: 30%
- Other conditions*: 30%
- Injuries: 9%
- Cancer: 13%
- Other chronic diseases: 9%
- Chronic respiratory diseases: 7%
- Diabetes: 2%

Other Conditions include communicable diseases, maternal/perinatal conditions, and nutritional deficiencies
NCD Risks

Fig. 1.5a Probability of dying from the four main noncommunicable diseases between the ages of 30 and 70 years, comparable estimates, 2012

Source: WHO, 2014

www.tobacconomics.org
Total Deaths by Income

- High-income countries: 5.9M (Group III - Injuries) + 0.9M (Other deaths from noncommunicable diseases)
- Upper middle-income: 3.0M (Group II - Other deaths from noncommunicable diseases) + 1.1M (Group II - Premature deaths from noncommunicable diseases)
- Lower middle-income: 3.3M (Group II - Other deaths from noncommunicable diseases) + 3.0M (Other deaths from noncommunicable diseases)
- Low-income countries: 2.3M (Group III - Injuries) + 6.8M (Other deaths from noncommunicable diseases) + 3.7M (Group II - Premature deaths from noncommunicable diseases)

Source: WHO 2010
Economic Consequences of NCDs

• Large economic burden from NCDs:
  • Considerable, growing health care costs from treating NCDs
  • Significant lost productivity
  • Cause of poverty
  • Account for much of inequalities in health
Growing Economic Costs

Figure 2: Cumulative NCD loss, beginning in 2011

Source: Based on The Global Economic Burden of Non-communicable Diseases
Prepared by the World Economic Forum and the Harvard School of Public Health (2011)
## NCDs: Major Risk Factors

<table>
<thead>
<tr>
<th>Major NCD</th>
<th>Major modifiable causative Risk Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tobacco Use</td>
</tr>
<tr>
<td>Heart Disease &amp; Stroke</td>
<td>✓</td>
</tr>
<tr>
<td>Diabetes</td>
<td>✓</td>
</tr>
<tr>
<td>Cancer</td>
<td>✓</td>
</tr>
<tr>
<td>Chronic Lung Disease</td>
<td>✓</td>
</tr>
</tbody>
</table>

Source: WHO, 2010; Mackay, 2012
Impact of Taxes & Prices on Risky Behaviors
"Sugar, rum, and tobacco, are commodities which are nowhere necessaries of life, which have become objects of almost universal consumption, and which are therefore extremely proper subjects of taxation."

Economics 101

• Law of the downward sloping demand curve:
  • Increase in price leads to reduction in the quantity consumed and vice-versa
• Price elasticity of demand
  • Percentage reduction in quantity demanded resulting from one percent increase in price
Taxes, Prices & Tobacco Use
Tobacco Consumption and Cigarette Prices
New Zealand, 1990-2013, Inflation Adjusted

Sources: EIU, World Bank and OECD
Cigarette Price & Consumption
Hungary, 1990-2011, Inflation Adjusted

Sources: EIU, ERC, and World Bank
Cigarette Prices & Adult Smoking Prevalence
United States, Inflation Adjusted 1970-2013

Sources: *Tax Burden on Tobacco*, BLS, NHIS, and author’s calculations
Adult Prevalence & Price, Brazil

Adult Smoking Prevalence and Cigarette Price
Brazil, Inflation Adjusted, 2006-2013

Sources: Ministry of Health, Brazil; EIU; World Bank
Monthly Quit Line Calls, United States
11/04-11/09

4/1/09 Federal Tax Increase

1/1/08 WI Tax Increase
Cigarette Prices and Cessation
US States, 2009

Source: BRFSS, *Tax Burden on Tobacco*, 2010, and author’s calculations
Cigarette Price & Youth Smoking Prevalence
High School Seniors, United States, 1991-2013

Sources: Tax Burden on Tobacco, BLS, MTF, and author's calculations
Cigarette Price & Youth Smoking Prevalence
Chile, 2000-2015

Source: Paraje, 2017
France: smoking, tax and male lung cancer, 1980-2010

Lung cancer death rates per 100,000 (divided by four): men age 35-44

# cigarettes/adult/day

Relative price

Source: Jha, in progress
Taxes, Prices & Excessive Drinking
Similarly extensive econometric and other research shows that higher prices for alcoholic beverages significantly reduce drinking:

- 10 percent price increase would reduce:
  - Beer consumption by 1.7 to 4.6 percent
  - Wine consumption by 3.0 to 6.9 percent
  - Spirits consumption by 2.9 to 8.0 percent
  - Overall consumption by 4.4 percent
  - Heavy drinking by 2.8 percent
  - Generally larger effects on youth and young adults

Source: Wagenaar et al., 2009
Beer Tax and Binge Drinking Prevalence
US States, 2010

Source: Xuan et al., 2013
Alcohol Prices & Consequences

- Extensive econometric and other research shows that higher prices for alcoholic beverages significantly reduce:
  - Drinking and driving, traffic crashes, and motor-vehicle accident fatalities

Source: Xin & Chaloupka, 2012; Wagenaar et al., 2010

www.tobacconomics.org
Alcohol Prices and Alcohol-Related Traffic Fatalities, US, All Ages, 1987-1993

Source: NHTSA, BLS, and author's calculations
Alcohol Prices and Alcohol-Related Traffic Fatalities, US, Ages 16-20, 1987-1993

Source: NHTSA, BLS, and author's calculations
Alcohol Prices & Consequences

- Econometric and other research shows that higher prices for alcoholic beverages significantly reduce:
  - Deaths from liver cirrhosis, acute alcohol poisoning, alcohol-related cancers, cardiovascular diseases, and other health consequences of excessive drinking
  - Violence (including spouse abuse, child abuse, and suicide) and other crime
  - Other consequences of drinking, including workplace accidents, teenage pregnancy, and incidence of sexually transmitted diseases

Source: Xin & Chaloupka, 20129; Wagenaar et al., 2010
Alcohol Prices & Consequences

• Recent systematic review concluded:
  • Doubling of alcohol taxes would reduce:
    • Alcohol-related mortality by 35%
    • Traffic crash deaths by 11%
    • Sexually transmitted disease by 6%
    • Violence by 2%
    • Crime by 1.4%

Source: Wagenaar et al., 2010
Taxes, Prices & Diet
Prices and Food & Beverage Consumption

Extensive economic research on the impact of food and beverage prices on consumption of various products; estimates suggest 10% own-price increase would reduce:

• Cereal consumption by 5.2%
• Soft drink consumption by 7.8%
• Sweets consumption by 3.5%
• Food away from home consumption by 8.1%

Source: Andreyeva, et al., 2010
Prices and Food & Beverage Consumption

Our more recent review finds similar evidence, with 10% increase in own-price leading to reductions in:

- Sugar-sweetened beverage consumption by 12.1%
- Fruit consumption by 4.9%
- Vegetable consumption by 4.8%
- Fast food consumption by 5.2%

Source: Powell, et al., 2013
Sweet & Savory Snack Prices & Consumption
Percentage Change, 2000-2014, Selected Countries

Source: Euromonitor, 2015, and author’s calculations
Soft Drink Prices & Consumption
Percentage Change, 2000-2014, Selected Countries

Source: Euromonitor, 2015, and author’s calculations
Taxes, Prices & Obesity
Selected Food Price & Adult Weight Trends
United States, 1961-2009, Inflation Adjusted

Prices and Weight Outcomes

Limited but rapidly growing research on impact of food and beverage prices and weight outcomes

Some evidence suggests that higher prices for less healthy options would lead to improvements in weight:

• Higher prices for sugary foods would significantly reduce prevalence of overweight and obesity among adults
• 10% increase in fast food prices would reduce prevalence of adolescent obesity by almost 6%
• Mixed evidence for impact of existing beverage taxes and weight outcomes, but more consistent evidence of price effects

Sources: Miljkovic et al., 2008, Powell, et al., 2007; Chaloupka et al., 2009; Powell, et al., 2013
The weight of the evidence increasingly indicates that changes in relative prices for healthier and less healthy foods will affect weight outcomes, with greater impact on:

- Lower income, less educated populations
- Younger populations
- Populations at greater risk for obesity

Source: Powell, et al., 2013
Prices and Weight Outcomes

Subsidies alone likely to be counter-productive:

- Increase consumption of subsidized products
- Income effect leads to increased consumption of other products
- Net increase in caloric intake
Sugary Beverage Taxes
Rationale for SSB Taxes

- Link to obesity
  - Several meta-analyses conclude that increased SSB consumption causes increased weight, obesity
  - Increased calories from SSBs not offset by reductions in calories from other sources

- Other health consequences
  - Type 2 diabetes, lower bone density, dental problems, headaches, anxiety and sleep disorders
Soda Consumption & Obesity
Selected Countries

Source: Soda consumption from Euromonitor, 2011; Obesity prevalence from OECD Health Data, 2005
Change in Soft Drink Affordability 2000-2013, Selected Countries

Source: Euromonitor, 2015, and author’s calculations
Soda Taxes in the U.S.

Mixed evidence for impact of U.S. soft drink taxes on obesity:

• Small state sales taxes
• Do not differentiate sugary vs. low/no calorie beverages
  • often taxes on healthier options
• Are not comprehensive
• Estimates suggest that tax needs to raise price by at least 20% to have an impact on weight outcomes

Source: Powell, et al., 2013

www.tobacconomics.org
Evidence from Mexico’s peso per liter SSB tax;

- Increased prices for SSBs relative to non-taxed beverages
  - pass through varies by type, size, location
- Significant reduction in SSB sales, consumption
  - growing over time
- Significant increase in bottled water consumption
- Greater impact on heavier consumers, low-income population

Sources: Colchero, et al., 2015; Colchero, et al., 2016; Colchero, et al., 2015; Ng, et al., under review
Impact of Tax on Sales
Mexico, 2007-2016

Impact on SSB sales consistent with reductions in purchases:
• 6% drop in 2014
• 8% drop in 2015
• 11% drop in first half of 2016

5.2% increases in bottled water sales

OLS- Adjusted for seasonality, the global indicator of the economic activity


Purchases of taxed beverages reduced in all SES groups

Reductions in purchases greatest among lowest SES households

9% decline in 2014

Colchero MA, Popkin BM, Rivera JA, Ng SW. Beverage purchases from stores in Mexico under the excise tax on sugar sweetened beverages: observational study. BMJ 2015;352
Oppositional Arguments
Food & Beverage Tax Policy

To date, relatively few governments have adopted significant taxes in efforts to promote healthier eating, reduce obesity:

• Mexico – implemented a one peso/liter tax on sugary drinks; 8% tax on junk foods

• Denmark – October 2011 fat tax on butter, milk, cheese, pizza, oil, processed foods, and other foods with saturated fat content > 2.3%
  • repealed November 2012

• Beverage taxes in a variety of countries, including France, Norway, Hungary, Guatemala, Finland, multiple Pacific Island countries
  • Increasing number of US jurisdictions (Berkeley, San Francisco, Oakland, Albany CA; Philadelphia PA; Boulder CO; Cook County IL

@tobacconomics
Fiscal Policy & NCDs

**Fig. 1.9** Fiscal interventions to address NCD risk factors, 2013, by WHO region and by World Bank income group.

- **Taxation on alcohol**
- **Taxation on high sugar content food and non-alcoholic beverages**
- **Price subsidies for healthy foods**
- **Taxation on tobacco**
- **Taxation on high fat foods**
- **Taxation incentives to promote physical activity**

AFR = African Region, AMR = Region of the Americas, SEAR = South-East Asia Region, EUR = European Region, EMR = Eastern Mediterranean Region, WPR = Western Pacific Region.
Industries and allies use several common arguments in opposition to tax increases:

- Won’t have the intended impact in terms of reducing use and consequences
- Will lead to extensive tax avoidance and tax evasion
- Will harm poor and working class consumers
- Will lead to massive job losses
Tax Avoidance & Evasion
Tax Avoidance & Evasion Do NOT Eliminate Health Impact of Higher Taxes

NYC Smoking Prevalence Declined as Price Increased

Source: Schroth, 2014
Tax Avoidance & Evasion Do NOT Eliminate Revenue Impact of Higher Taxes
Illicit Cigarette Market Share & Cigarette Prices, 2012

Sources: Euromonitor, WHO
Drivers of Illicit Tobacco

- Corruption
- Weak tax administration
- Poor enforcement
- Presence of informal distribution networks
- Presence of criminal networks
- Access to cheaper sources

Sources: NRC/IOM 2015; NCI/WHO 2016
Smuggling and Corruption, 2011

\[ y = -0.0131x + 0.2028 \]
\[ R^2 = 0.08146 \]

Sources: Euromonitor, Transparency International
Figure 12 – Estimated Volumes of Cigarettes Consumed in the U.K. – Duty paid, illicit, and cross-border shopping, 2000-01 – 2013-14

Source: HM Revenue & Customs, 2014
Combating Illicit Tobacco Trade

• Illicit trade protocol to the WHO FCTC
  – Adopted November 2012; currently in process of being signed/ratified; provisions calling for:
  – Strong tax administration
    • Prominent, high-tech tax stamps and other pack markings
    • Licensing of manufacturers, exporters, distributors, retailers
    • Export bonds
    • Unique identification codes on packages
  – Better enforcement
    • Increased resources
    • Focus on large scale smuggling
  – Swift, severe penalties
  – Multilateral/intersectoral cooperation

www.tobacconomics.org
Beverage Tax Avoidance & Evasion

Little evidence of significant tax avoidance & evasion

- low taxes relative to prices
- costly to avoid/evade taxes

Illinois – recent experiences with beer taxes

- IL – raised tax from 7 cents/gallon to 18.5 cents/gallon, August 1999; again to 23.1 cents/gallon September 2009
- Iowa – 19 cents/gallon throughout
- Indiana - 11.5 cents/gallon throughout
- Wisconsin – 6.45 cents/gallon throughout
Percent Change in State Beer Taxes Revenues, IL, IN, IA & WI, 1998-2000

- IL: 167.3%
- IA: 3.5%
- IN: 2.8%
- WI: -3.5%

Source: Brewers’ Almanac, 2013, and author’s calculations
Percent Change in Beer Taxes Revenues
IL, IA, IN, WI 2008-2010

Source: Brewers’ Almanac, 2013, and author’s calculations
Impact on the Poor
Tobacco & Poverty

Family falls into poverty

Foregone income 1:
More money spent on tobacco:  Less money spent on Education, nutrition etc

High opportunity cost

Foregone income 2:
Treatment cost & Lost working days & income

Foregone income 3:
Breadwinner dies prematurely

Breadwinner gets sick due to tobacco use

Source: Yurekli, 2007
Impact on the Poor

• Concerns about the regressivity of higher alcohol & tobacco taxes, food/beverage taxes

  • Most excise taxes are regressive, but tax increases can be progressive

    • Greater price sensitivity of poor – relatively large reductions in use among lowest income populations, small reductions among higher income populations

  • Health benefits that result from tax increase are progressive

www.tobacconomics.org
Who Pays & Who Benefits
Turkey, 25% Tax Increase

Source: Adapted from Önder & Yürekli, 2014
Impact on the Poor

– Need to consider overall fiscal system
  • Key issue with taxes is what’s done with the revenues generated by the tax
  • Greater public support for tax increases when revenues are used for prevention & control programs and/or other health programs
  • Net financial impact on low income households can be positive when taxes are used to support programs targeting the poor
  • Concerns about regressivity offset by use of revenues for programs directed to poor
Impact on the Economy
Excise Taxes and Jobs

Industries argue that production and consumption of their products makes a significant economic contribution

- employment in farming, manufacturing, distribution, retailing, and related sectors
- multiplier effects as income earned in these jobs is spent on other goods & services

www.tobacconomics.org
Excise Taxes and Jobs

Industry-sponsored studies tell only part of story:

• Focus on the gross impact:
  • New tax or tax increase will lead to decreased consumption of taxed product
  • Results in loss of some jobs dependent on production of taxed product

• Ignore the net impact:
  • Money not spent on taxed product will be spent on other goods and services
  • New/increased tax revenues spent by government
    • *Offsetting job gains in other sectors*
Tobacco Taxes and Jobs

• Many published studies assess impact of reductions in tobacco use from tax increases and/or other tobacco control measures:
  • Variety of high, middle, and low income countries
  • Use alternative methodologies
• Generally find that employment losses in tobacco sector more than offset by gains in other sectors

www.tobacconomics.org
Tobacco Taxes and Jobs

Concerns about job losses in tobacco sector have been addressed using new tax revenues:

- Turkey, Philippines among countries that have allocated tobacco tax revenues to helping tobacco farmers and/or those employed in tobacco manufacturing make transition to other livelihoods
  - Crop substitution programs, retraining programs
Employment Impact of Sugar-Sweetened Beverage Taxes

Lisa M. Powell, PhD, Roy Wada, PhD, Joseph J. Persky, PhD, and Frank J. Chaloupka, PhD

Sugar-sweetened beverages (SSBs) are the leading source of added sugar in the American diet and are associated with increased risk of type 2 diabetes, cardiovascular disease, dental caries, osteoporosis, and obesity. From 1988–1994 to 1999–2004, average daily caloric intake of SSBs increased from 157 to 203 kilocalories among adults and from 204 to 224 kilocalories among children aged 2 to 19 years. Recently, SSB consumption prevalence fell across all age groups from 1999–2000 to 2007–2008, although the prevalence of sports and energy drinks increased and heavy SSB consumption (≥ 500 kcal/day) increased among children. In 2009–2010, Objectives. We assessed the impact of sugar-sweetened beverage (SSB) taxes on net employment.

Methods. We used a macroeconomic simulation model to assess the employment impact of a 20% SSB tax accounting for changes in SSB demand, substitution to non-SSBs, income effects, and government expenditures of tax revenues for Illinois and California in 2012.

Results. We found increased employment of 4406 jobs in Illinois and 6654 jobs in California, representing a respective 0.06% and 0.03% change in employment. Declines in employment within the beverage industry occurred but were offset by new employment in nonbeverage industry and government sectors.

Conclusions. SSB taxes do not have a negative impact on state-level employment, and industry claims of regional job losses are overstated and may mislead lawmakers and constituents. (Am J Public Health. 2014;104:672–677. doi:10.2105/AJPH.2013.301630)
## Alcohol Taxes & Jobs
Estimated impact of tax increases in Illinois

### Effects on Employment

*Potential Impact of Alcohol Tax Increases on Jobs*

<table>
<thead>
<tr>
<th>Tax/Drink</th>
<th>General Fund</th>
<th>Healthcare</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0.05</td>
<td>2530</td>
<td>877</td>
</tr>
<tr>
<td>$0.10</td>
<td>4894</td>
<td>1694</td>
</tr>
<tr>
<td>$0.25</td>
<td>11204</td>
<td>3863</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sales Tax</th>
<th>General Fund</th>
<th>Healthcare</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td>2371</td>
<td>610</td>
</tr>
</tbody>
</table>

Summary
Conclusions

• Higher tobacco and alcohol taxes, and new sugary beverage taxes will significantly reduce consumption

• Reduced consumption will lead to fewer cases of cancer, cardiovascular disease, diabetes, and other non-communicable diseases

• Counterarguments about negative economic impact false or greatly overstated

• Taxes generally considered one of the “best buys” in NCD prevention
THANK YOU!

For more information:

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

Tobacconomics
http://www.tobacconomics.org

@BTGResearch

@tobacconomics

fjc@uic.edu