

tobacconomics

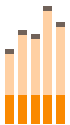
Economic Research Informing Tobacco Control Policy

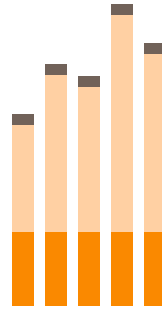
Using Fiscal Policy to Prevent Non-Communicable Diseases

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

Overview

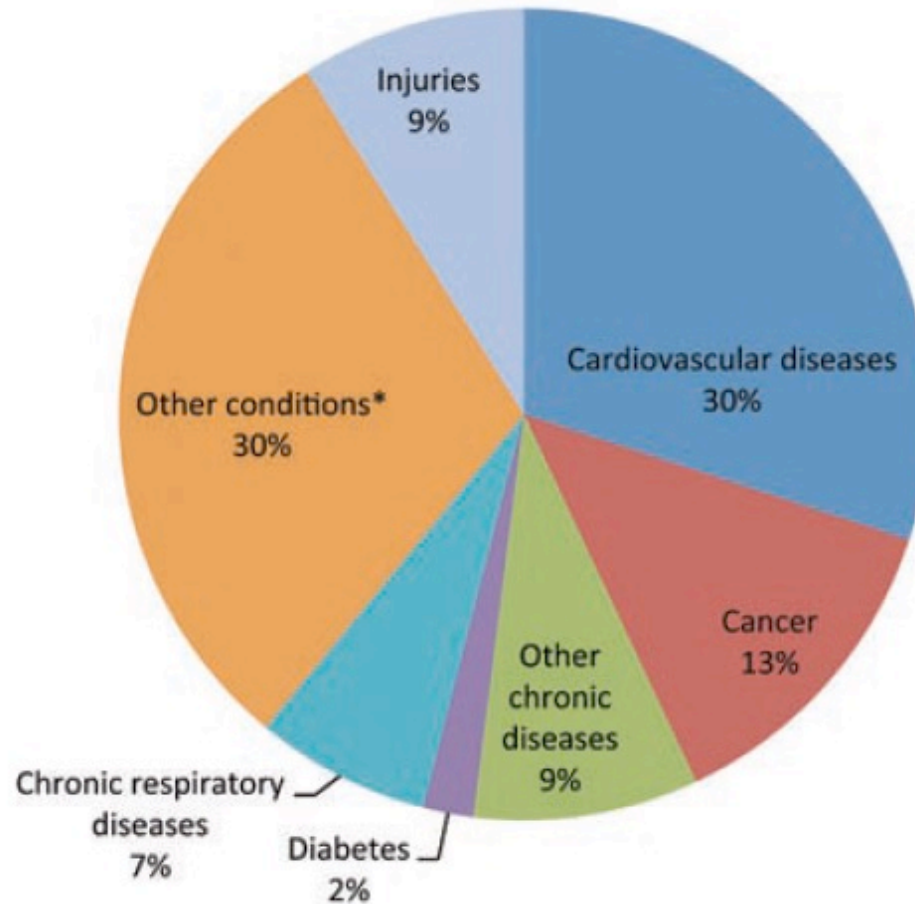
- Health & Economic Impact of Non-Communicable Diseases
- Impact of Tobacco, Alcohol, and Sugary Beverage Taxes on Use and Consequences of Use
- Myths and Facts About Economic Impact of Taxes





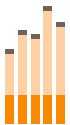
Health & Economic Impact of NCDs

Leading Causes of Death Globally



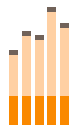
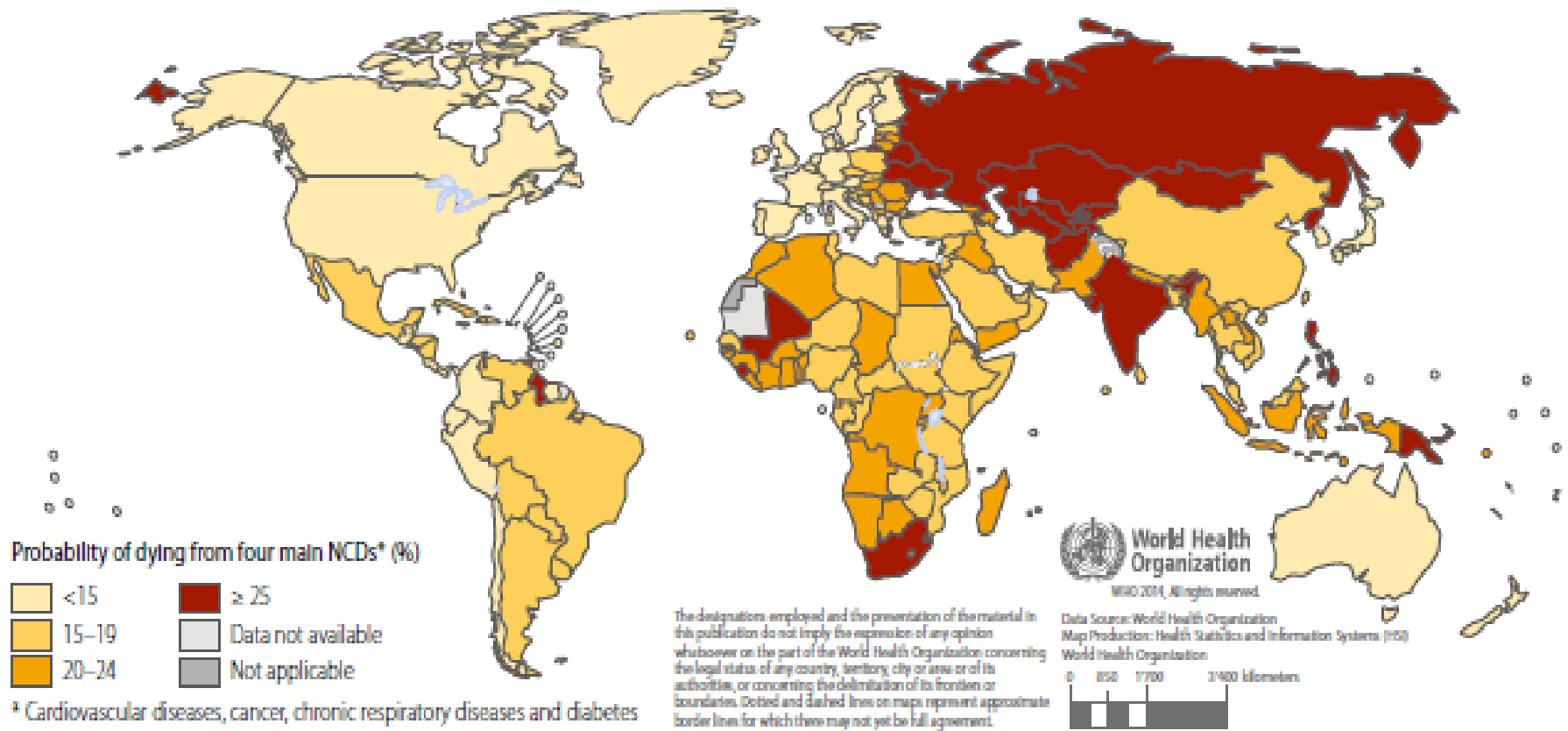
Source: World Economic Forum & Harvard School of Public Health, 2011

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



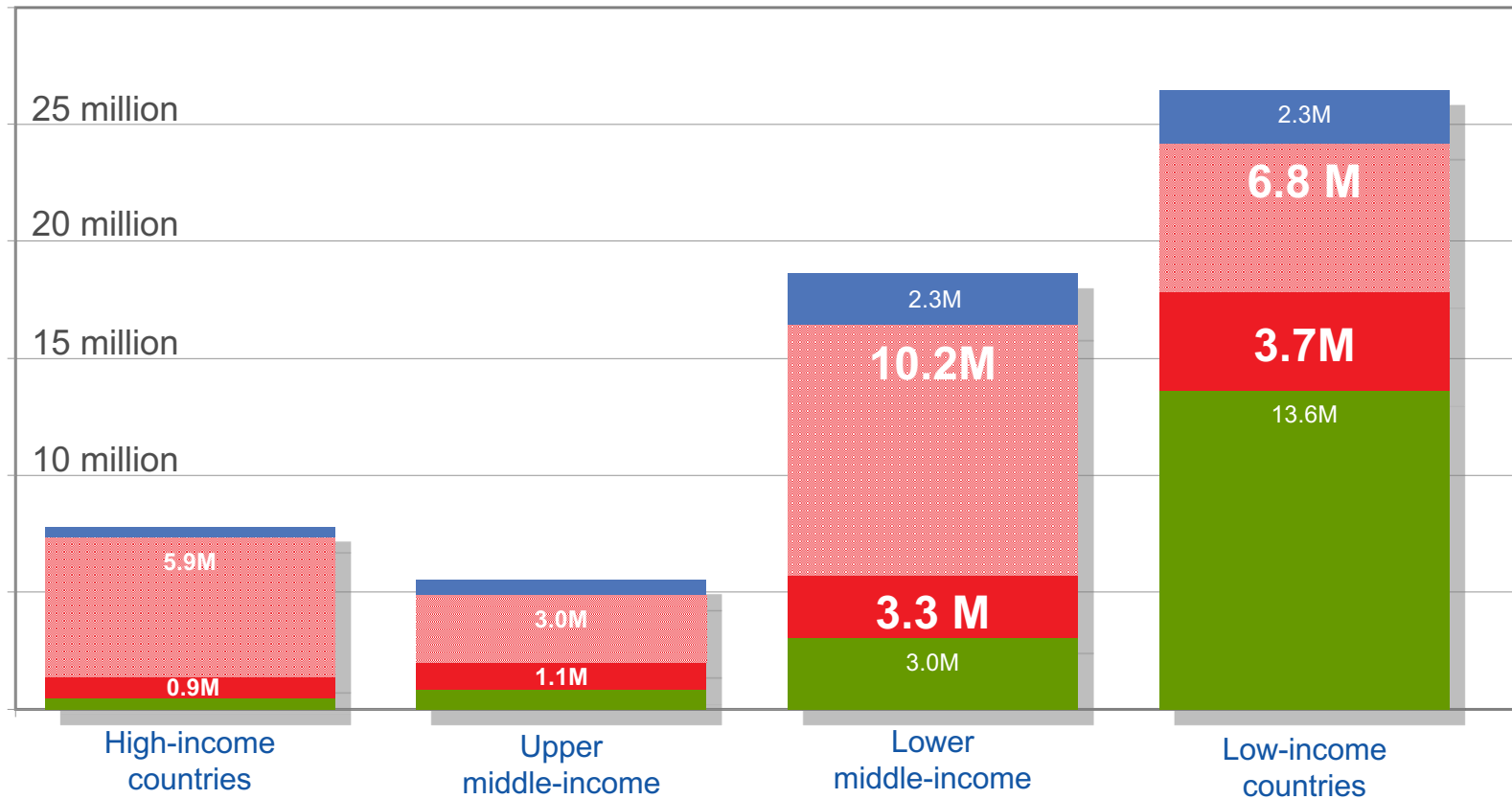
NCD Risks

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

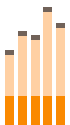


Total Deaths by Income

Source:



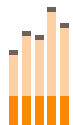
- Group III - Injuries
- Group II - Other deaths from noncommunicable diseases
- Group II - Premature deaths from noncommunicable diseases (below the age of 60), which are preventable
- Group I - Communicable diseases, maternal, perinatal and nutritional conditions



Source: WHO 2010

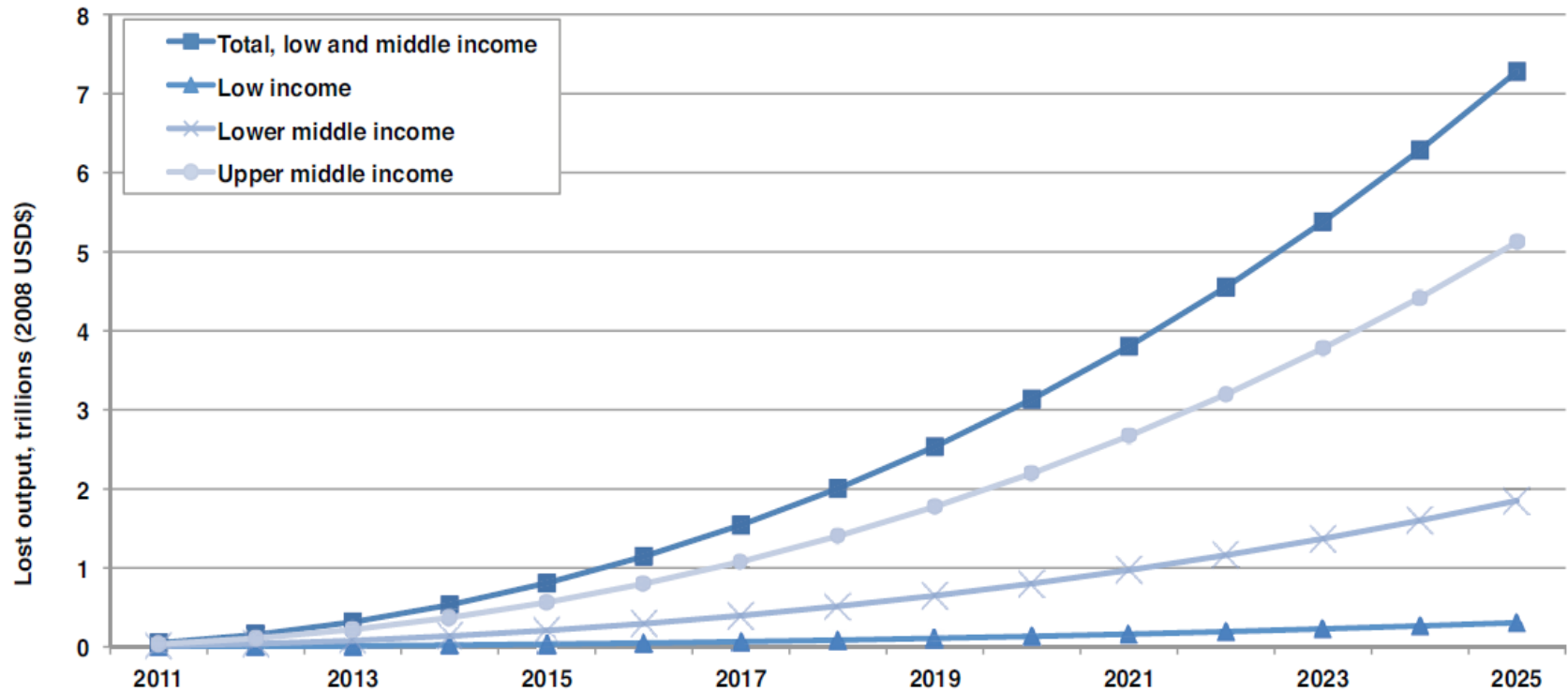
Economic Consequences of NCDs

- **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



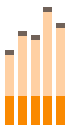
Growing Economic Costs

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)

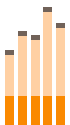
Source: World Economic Forum & Harvard School of Public Health, 2011

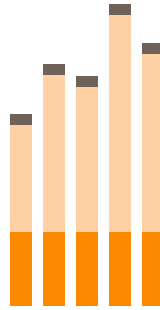


NCDs: Major Risk Factors

Major NCD	Major modifiable causative Risk Factors			
	Tobacco Use	Unhealthy Diet	Physical Inactivity	Harmful Use of Alcohol
Heart Disease & Stroke	✓	✓	✓	✓
Diabetes	✓	✓	✓	✓
Cancer	✓	✓	✓	✓
Chronic Lung Disease	✓			

Source: WHO, 2010; Mackay, 2012

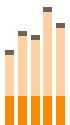




Impact of Taxes & Prices on Risky Behaviors

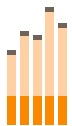
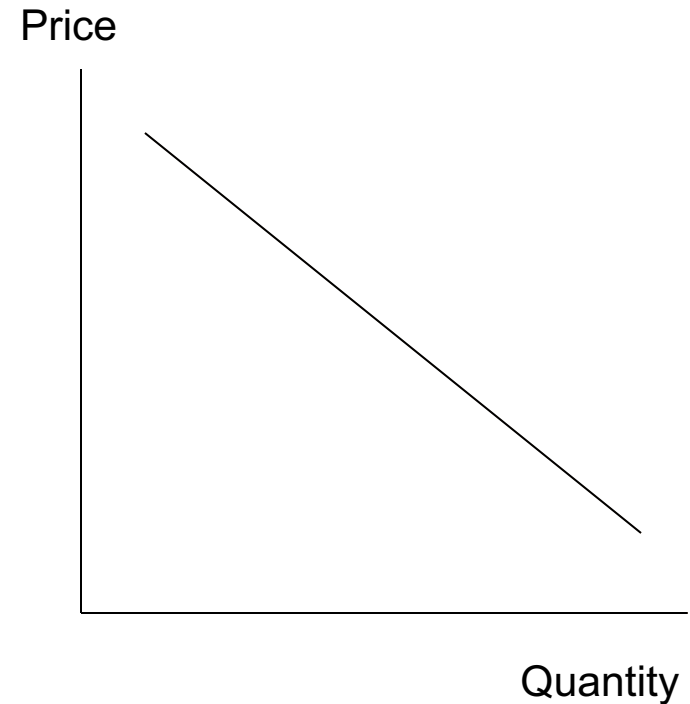
*"**Sugar, rum, and tobacco**, are commodities which are no where necessaries of life, which are become objects of almost universal consumption, and which are therefore **extremely proper subjects of taxation.***

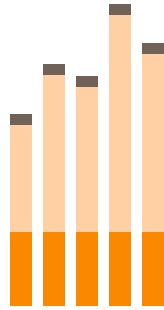
Adam Smith, *An Inquiry into the Nature and Causes of The Wealth of Nations*, 1776



Economics 101

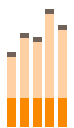
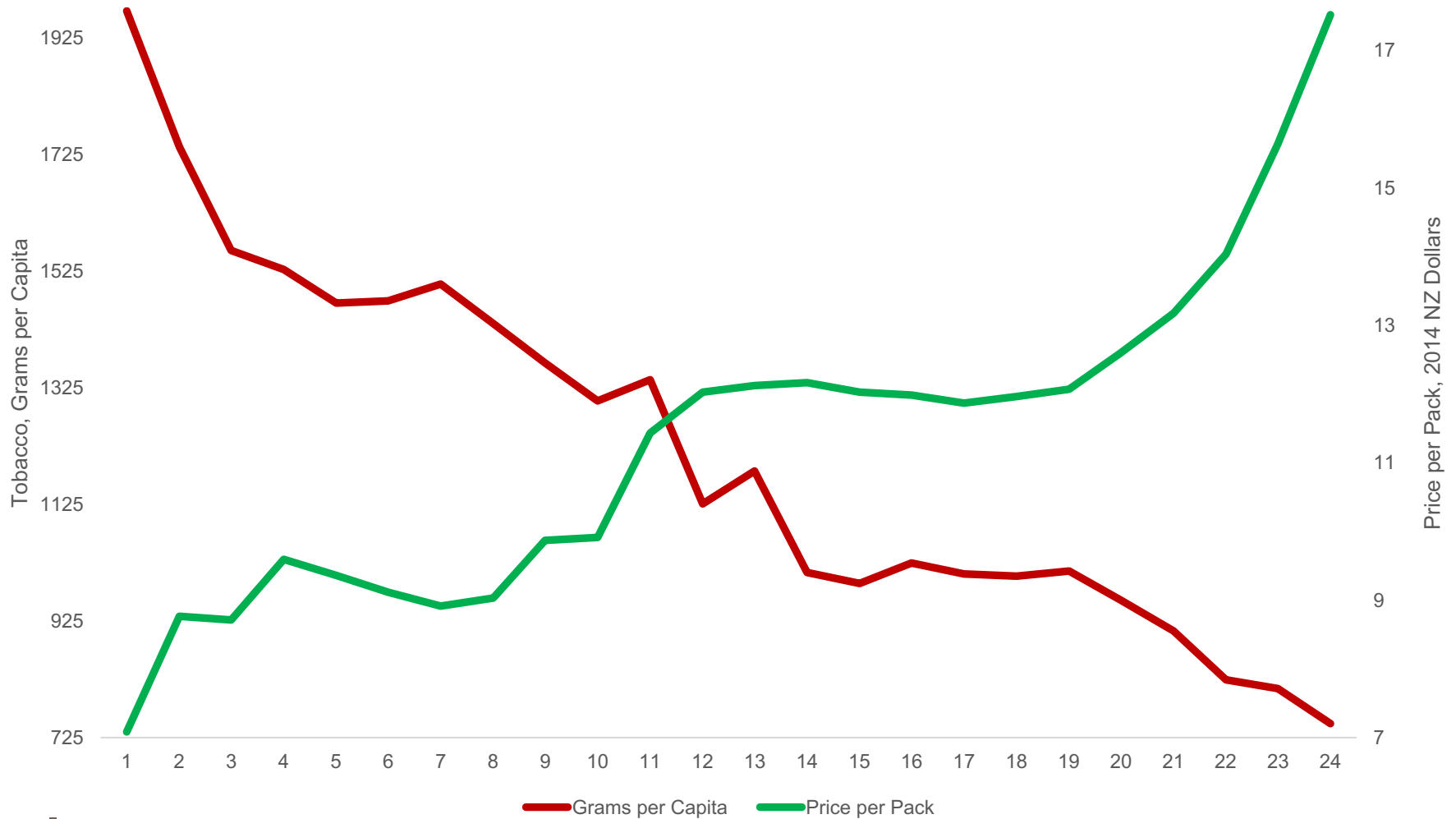
- **Law of the downward sloping demand curve:**
 - Increase in price leads to reduction in the quantity consumed and vice-versa
- **Price elasticity of demand**
 - Percentage reduction in quantity demanded resulting from one percent increase in price





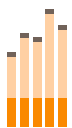
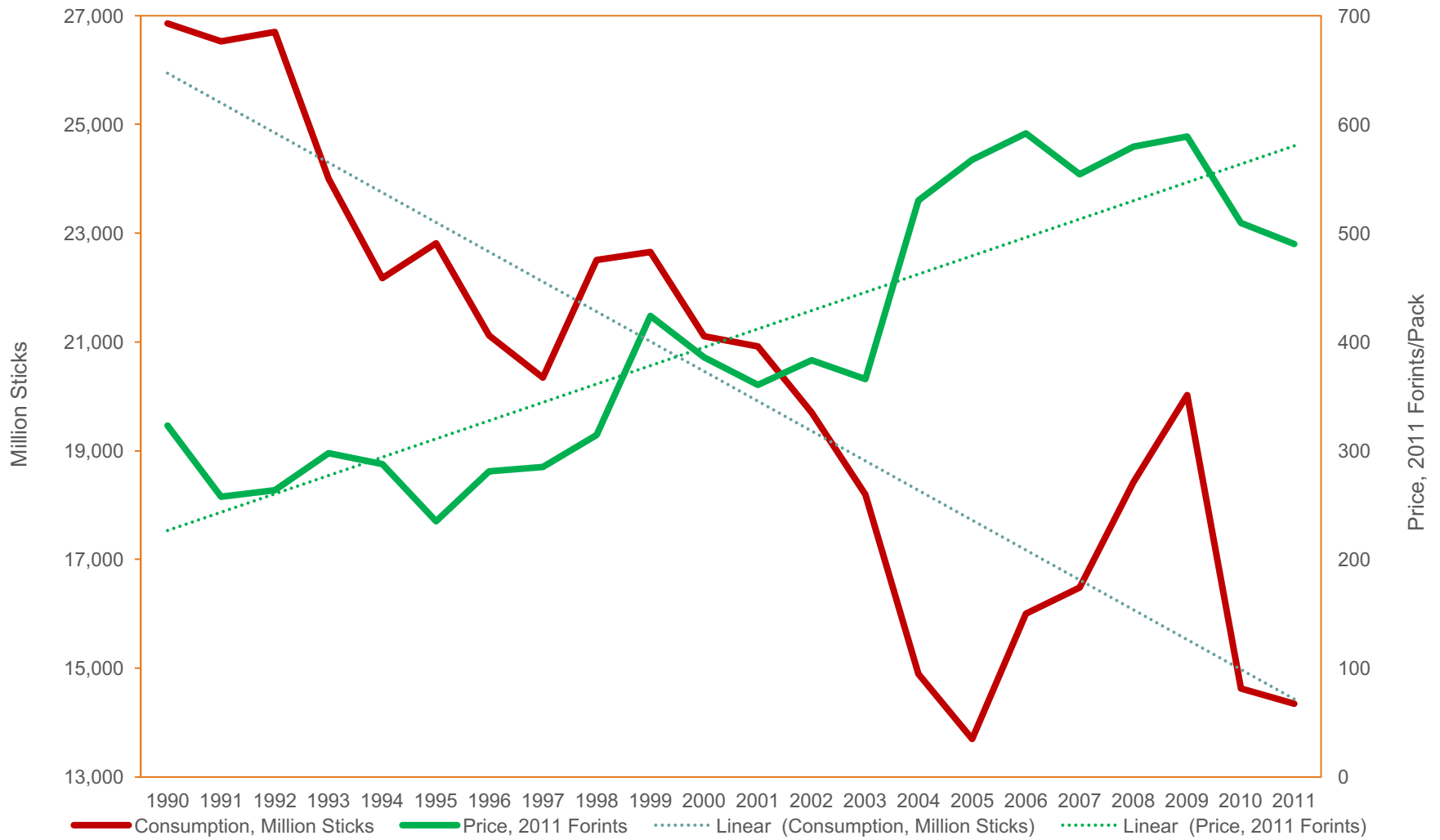
Taxes, Prices & Tobacco Use

Tobacco Consumption and Cigarette Prices New Zealand, 1990-2013, Inflation Adjusted



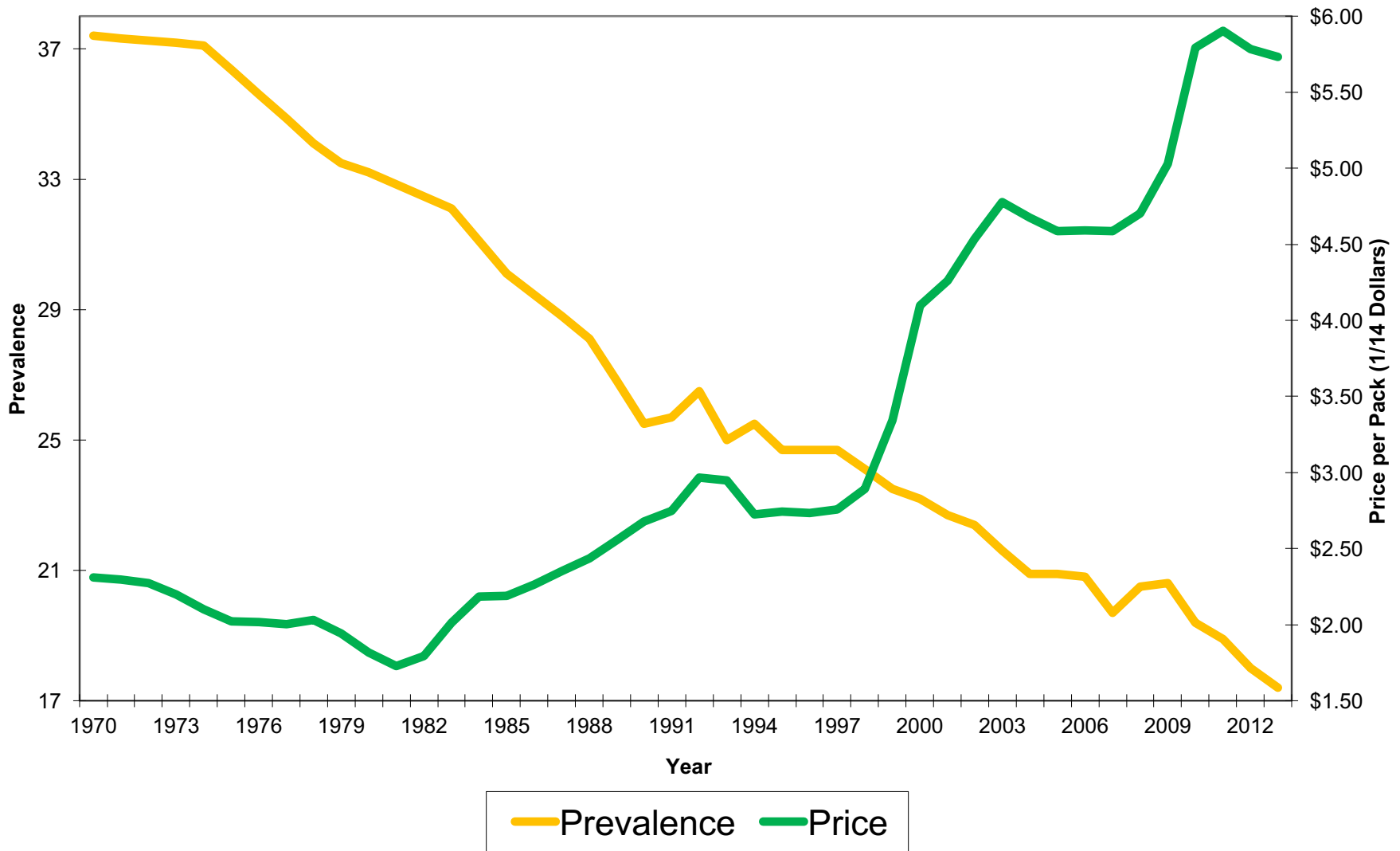
Cigarette Price & Consumption

Hungary, 1990-2011, Inflation Adjusted

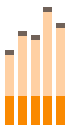


Sources: EIU, ERC, and World Bank

Cigarette Prices & Adult Smoking Prevalence United States, Inflation Adjusted 1970-2013

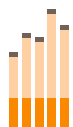
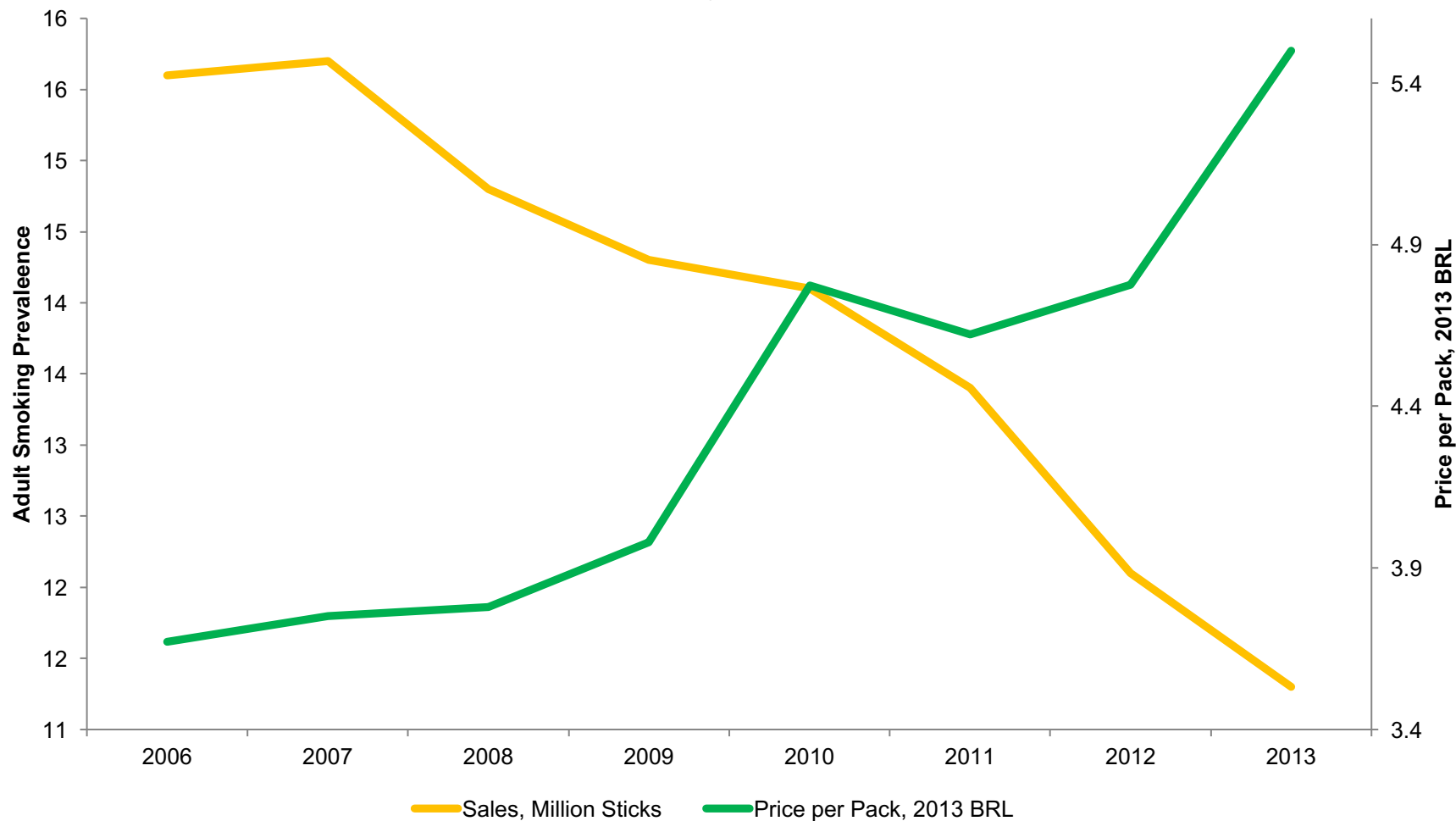


Sources: *Tax Burden on Tobacco*, BLS, NHIS, and author's calculations

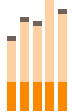
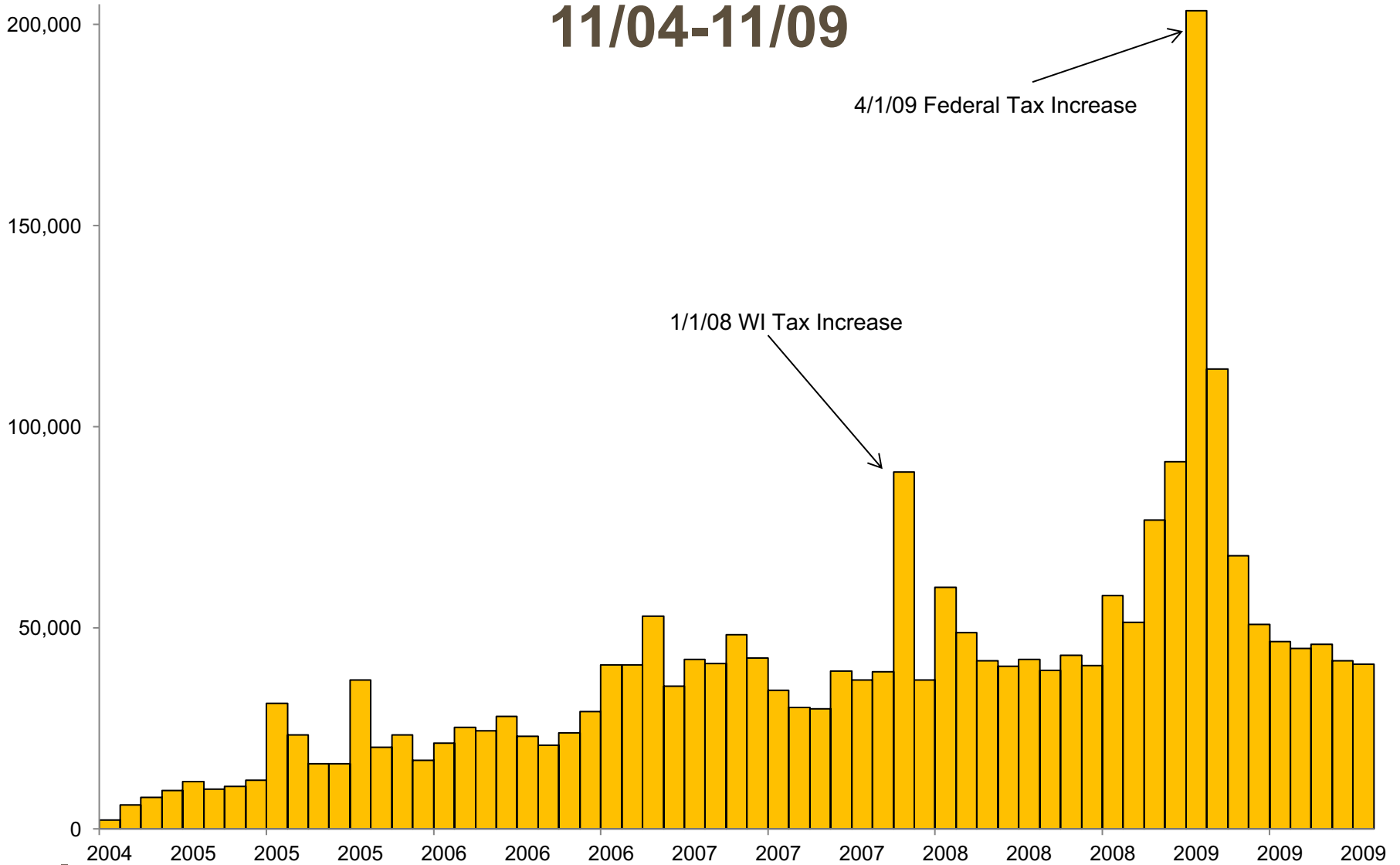


Adult Prevalence & Price, Brazil

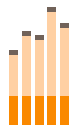
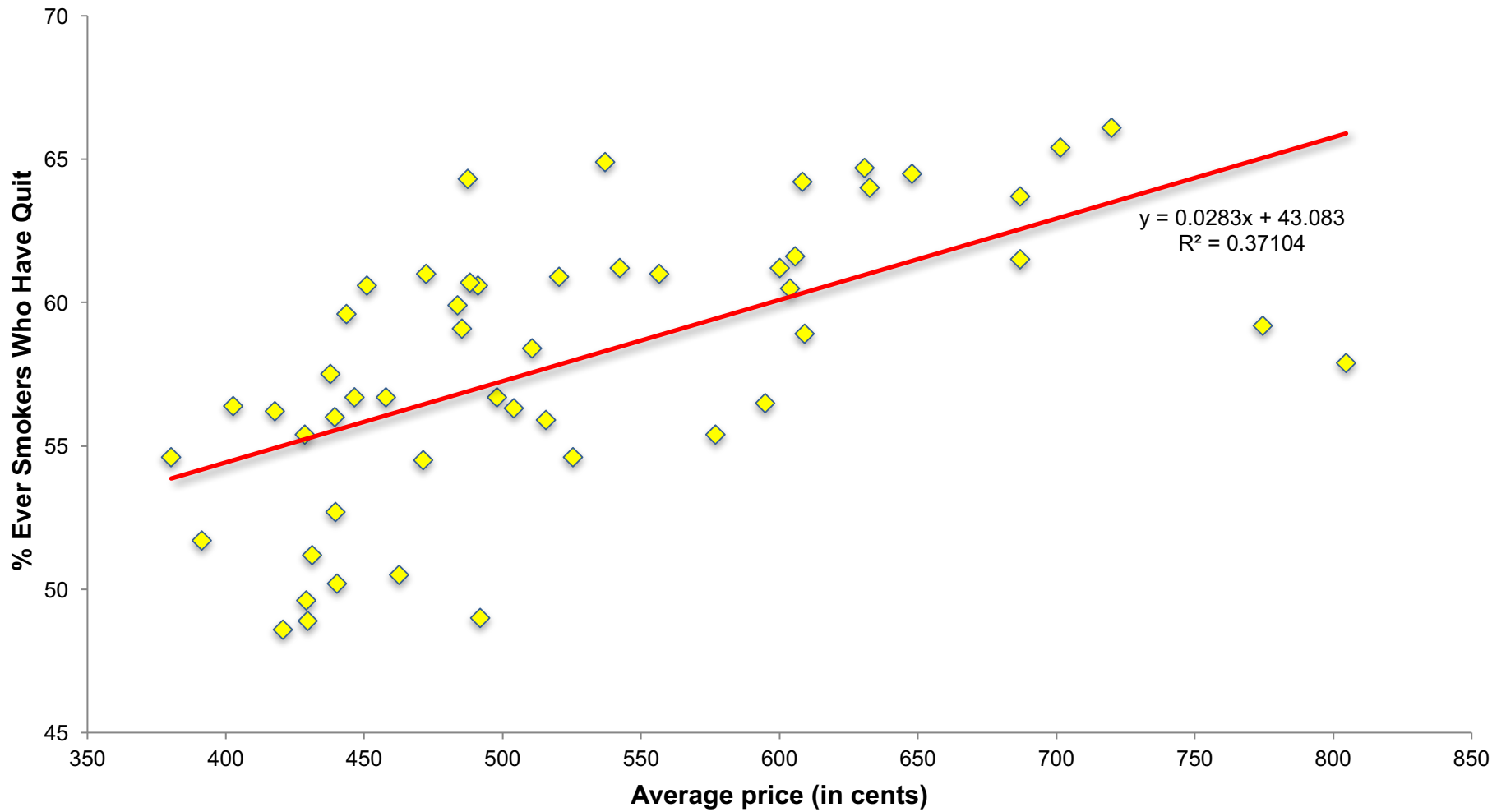
Adult Smoking Prevalence and Cigarette Price
Brazil, Inflation Adjusted, 2006-2013



Monthly Quit Line Calls, United States 11/04-11/09



Cigarette Prices and Cessation US States, 2009

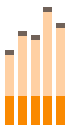


Source: BRFSS, *Tax Burden on Tobacco*, 2010, and author's calculations

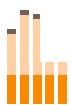
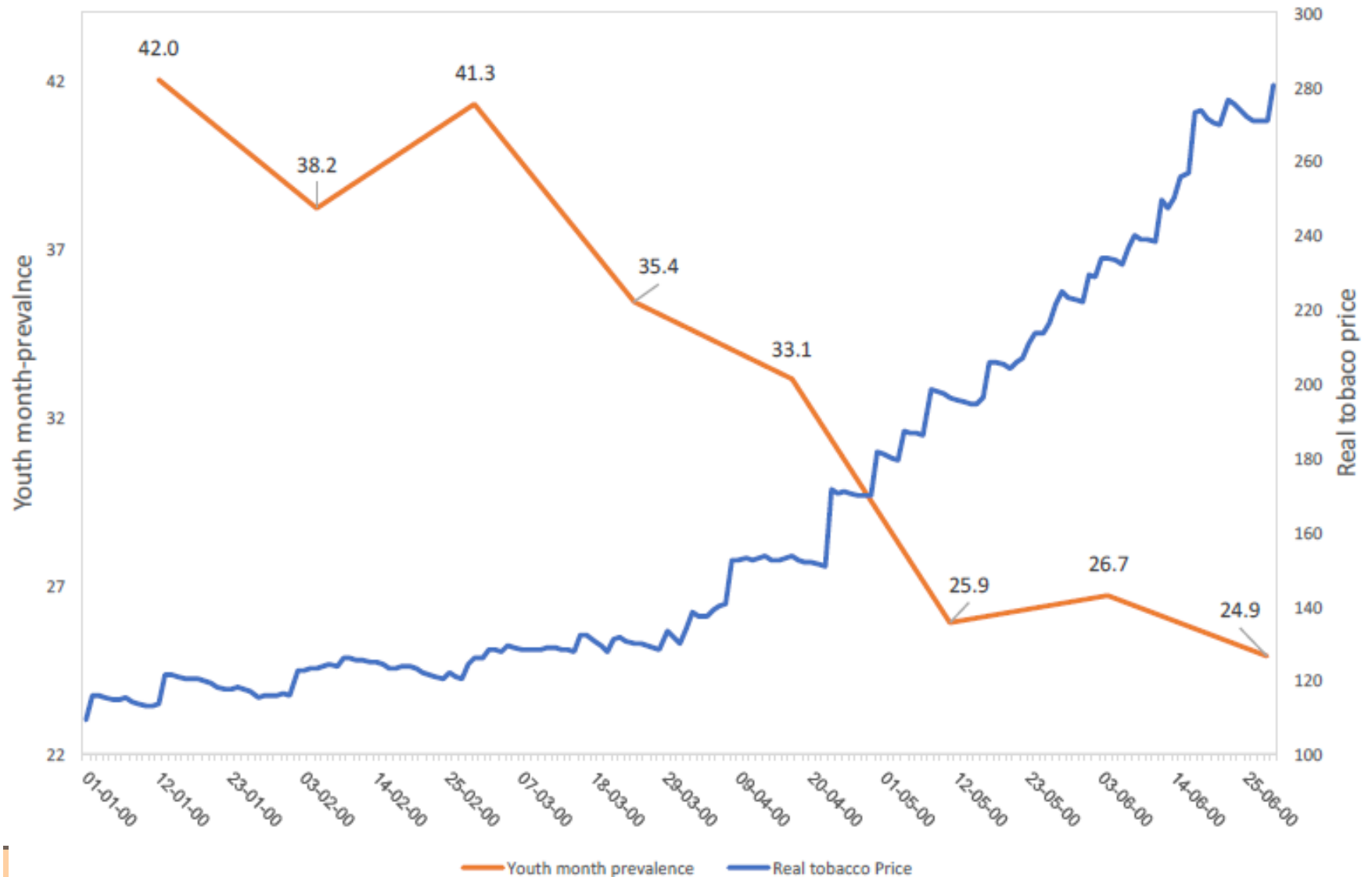
Cigarette Price & Youth Smoking Prevalence High School Seniors, United States, 1991-2013



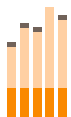
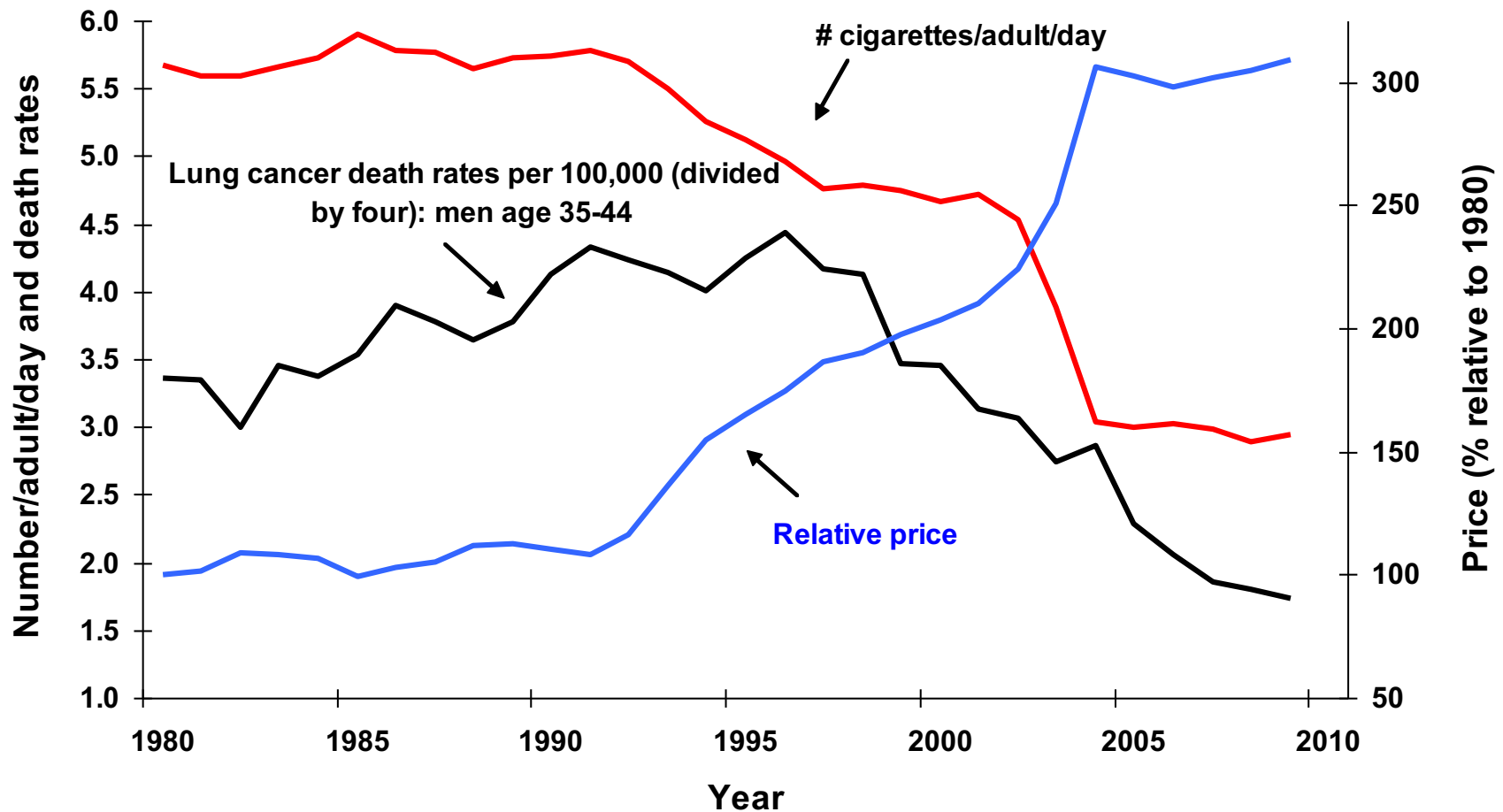
Sources: *Tax Burden on Tobacco*, BLS, MTF, and author's calculations

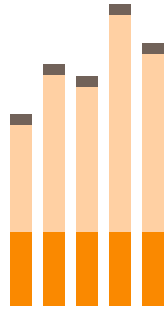


Cigarette Price & Youth Smoking Prevalence Chile, 2000-2015



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

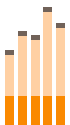




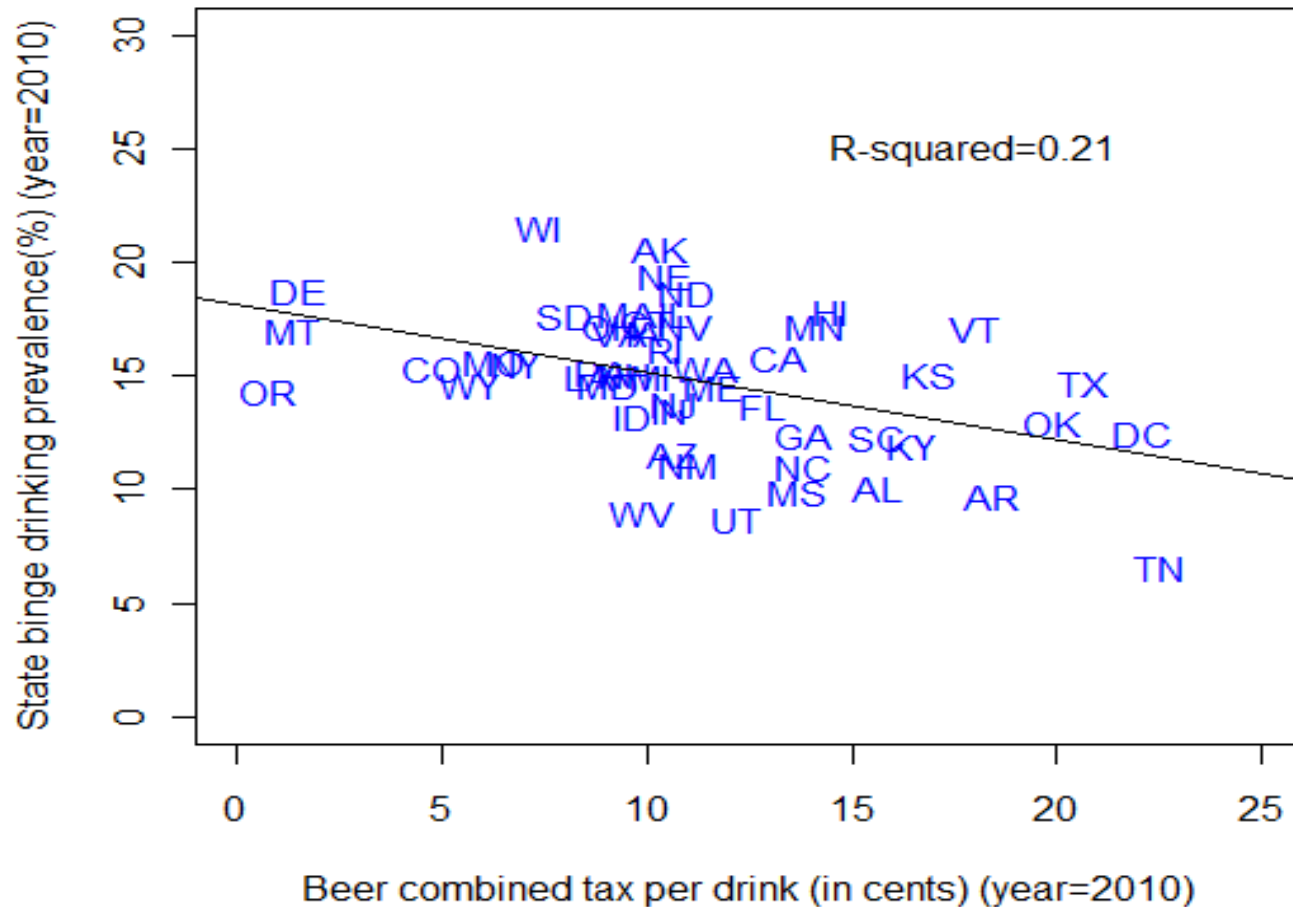
Taxes, Prices & Excessive Drinking

Alcohol Prices & Drinking

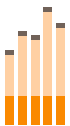
- **Similarly extensive econometric and other research shows that higher prices for alcoholic beverages significantly reduce drinking:**
 - 10 percent price increase would reduce:
 - Beer consumption by 1.7 to 4.6 percent
 - Wine consumption by 3.0 to 6.9 percent
 - Spirits consumption by 2.9 to 8.0 percent
 - Overall consumption by 4.4 percent
 - Heavy drinking by 2.8 percent
 - Generally larger effects on youth and young adults



Beer Tax and Binge Drinking Prevalence US States, 2010



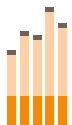
Source: Xuan et al., 2013



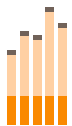
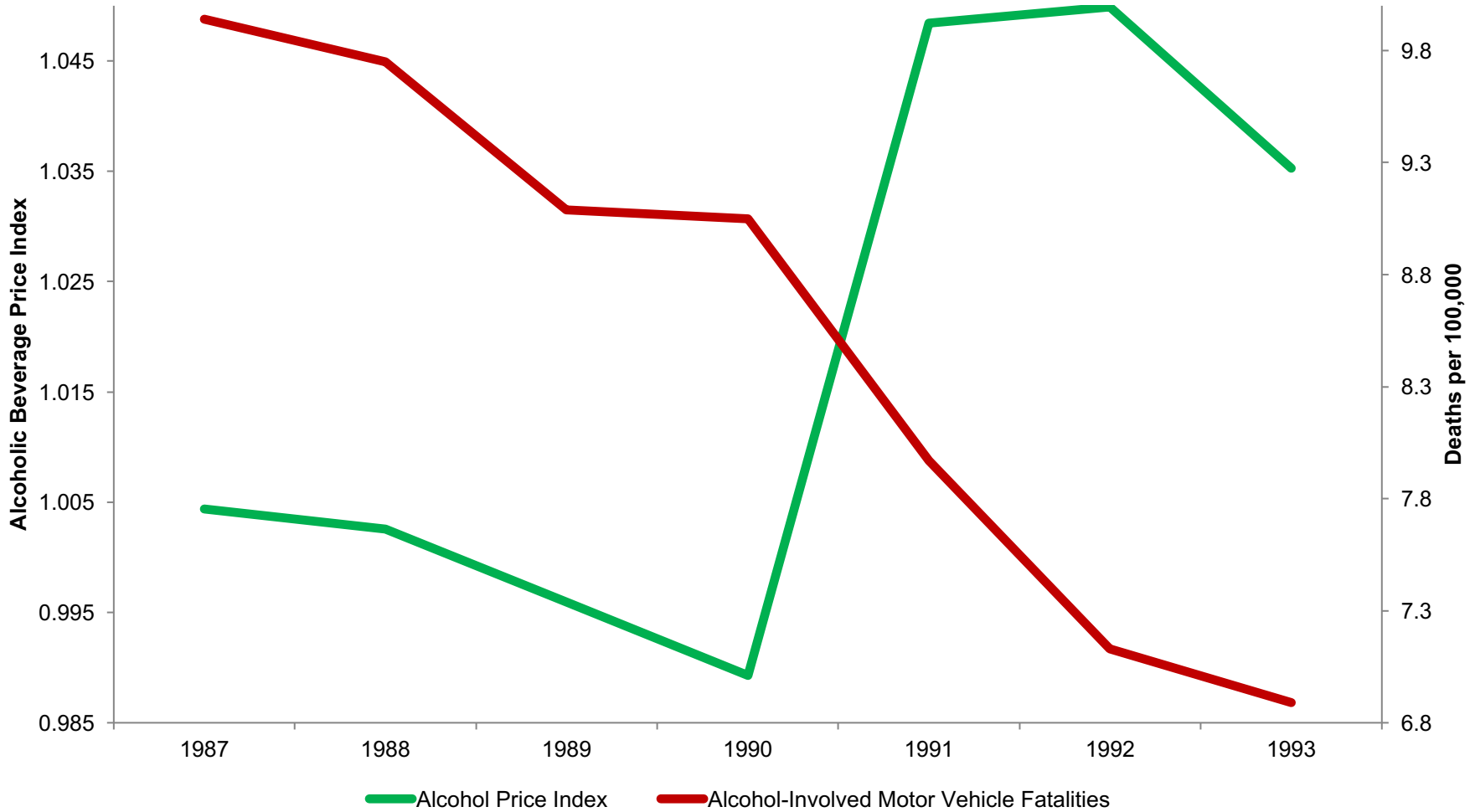
Alcohol Prices & Consequences

- **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

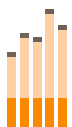
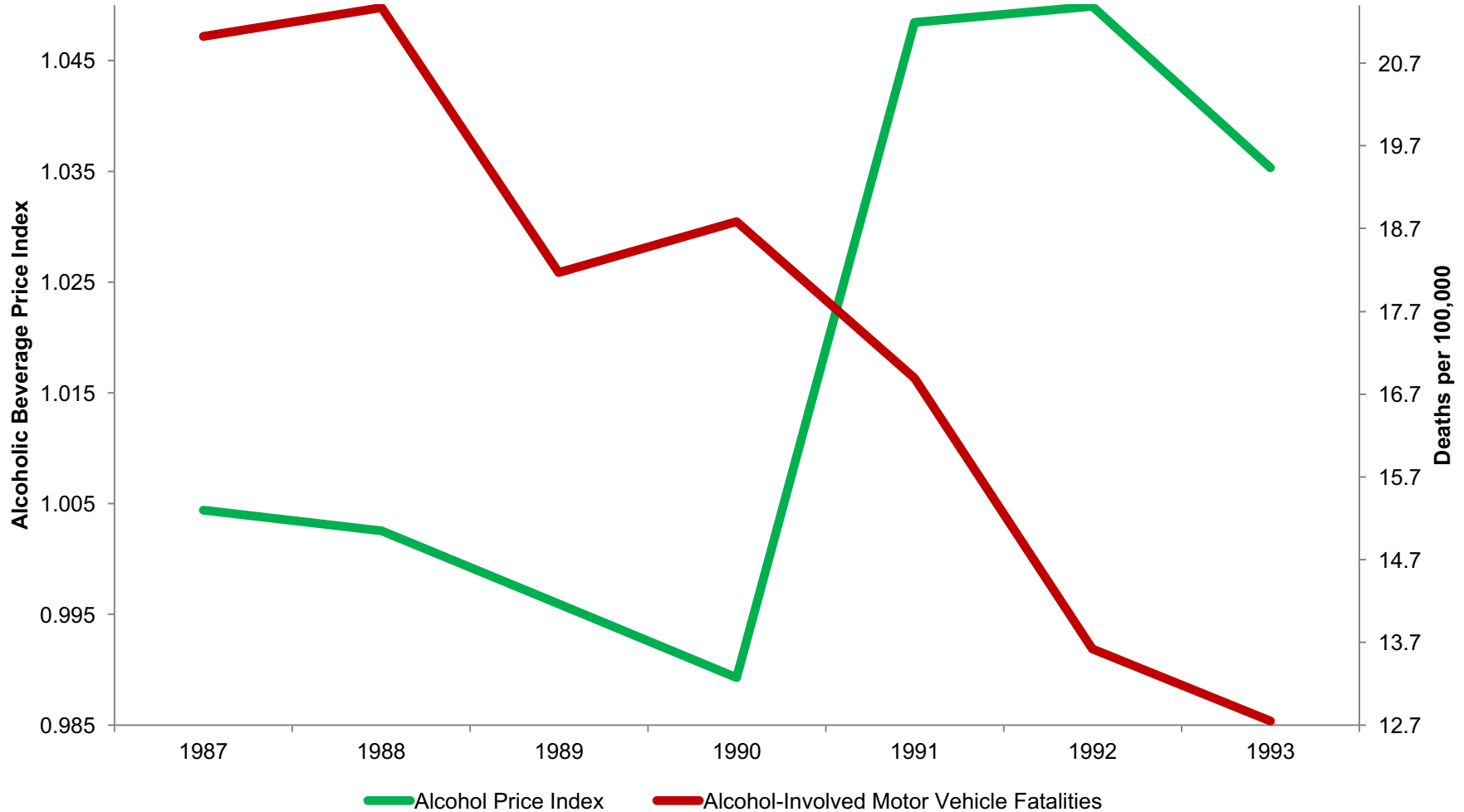


Alcohol Prices and Alcohol-Related Traffic Fatalities, US, All Ages, 1987-1993



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

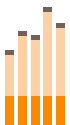
- **Econometric and other research shows that higher prices for alcoholic beverages significantly reduce:**
 - Deaths from liver cirrhosis, acute alcohol poisoning, alcohol-related cancers, cardiovascular diseases, and other health consequences of excessive drinking
 - Violence (including spouse abuse,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

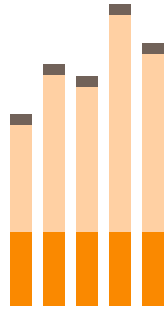


Alcohol Prices & Consequences

- 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



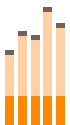


Taxes, Prices & Diet

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%

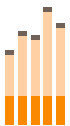


Prices and Food & Beverage Consumption

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

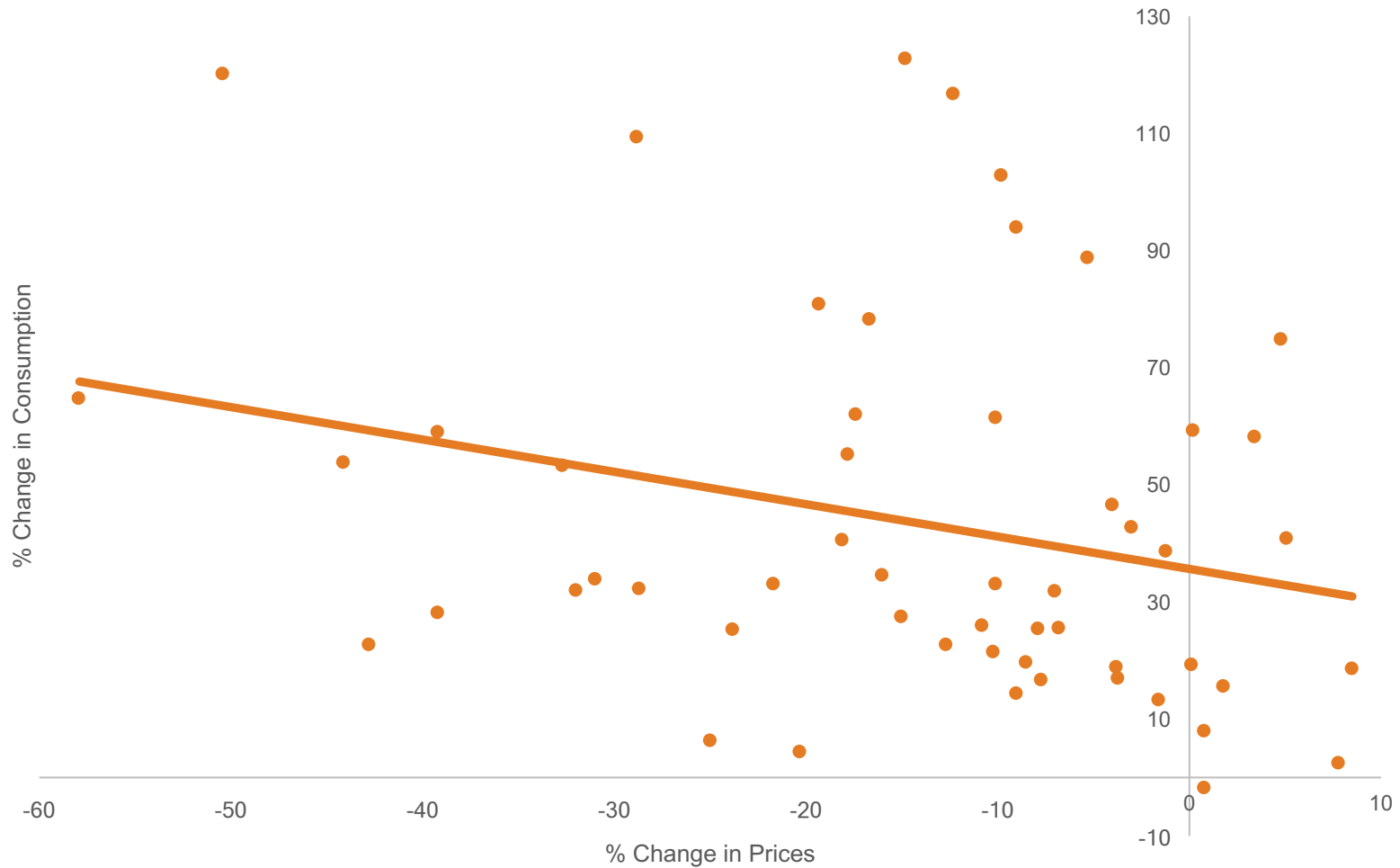
- Sugar-sweetened beverage consumption by 12.1%
- Fruit consumption by 4.9%
- Vegetable consumption by 4.8%
- Fast food consumption by 5.2%

Source: Powell, et al., 2013

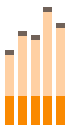


Sweet & Savory Snack Prices & Consumption

Percentage Change, 2000-2014, Selected Countries

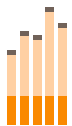
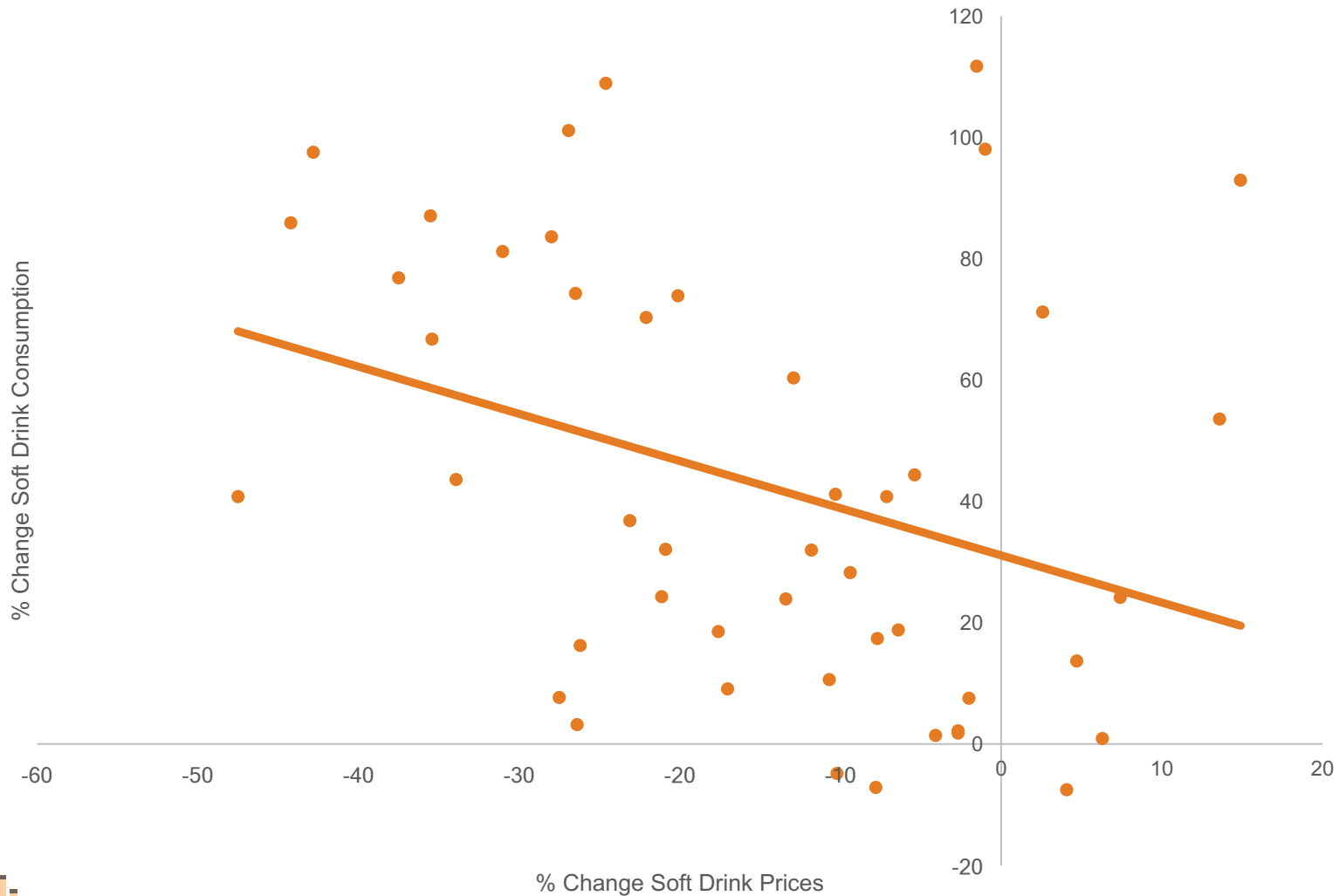


Source: Euromonitor, 2015, and author's calculations

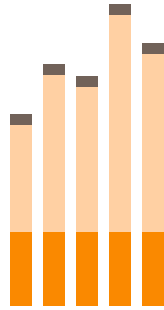


Soft Drink Prices & Consumption

Percentage Change, 2000-2014, Selected Countries



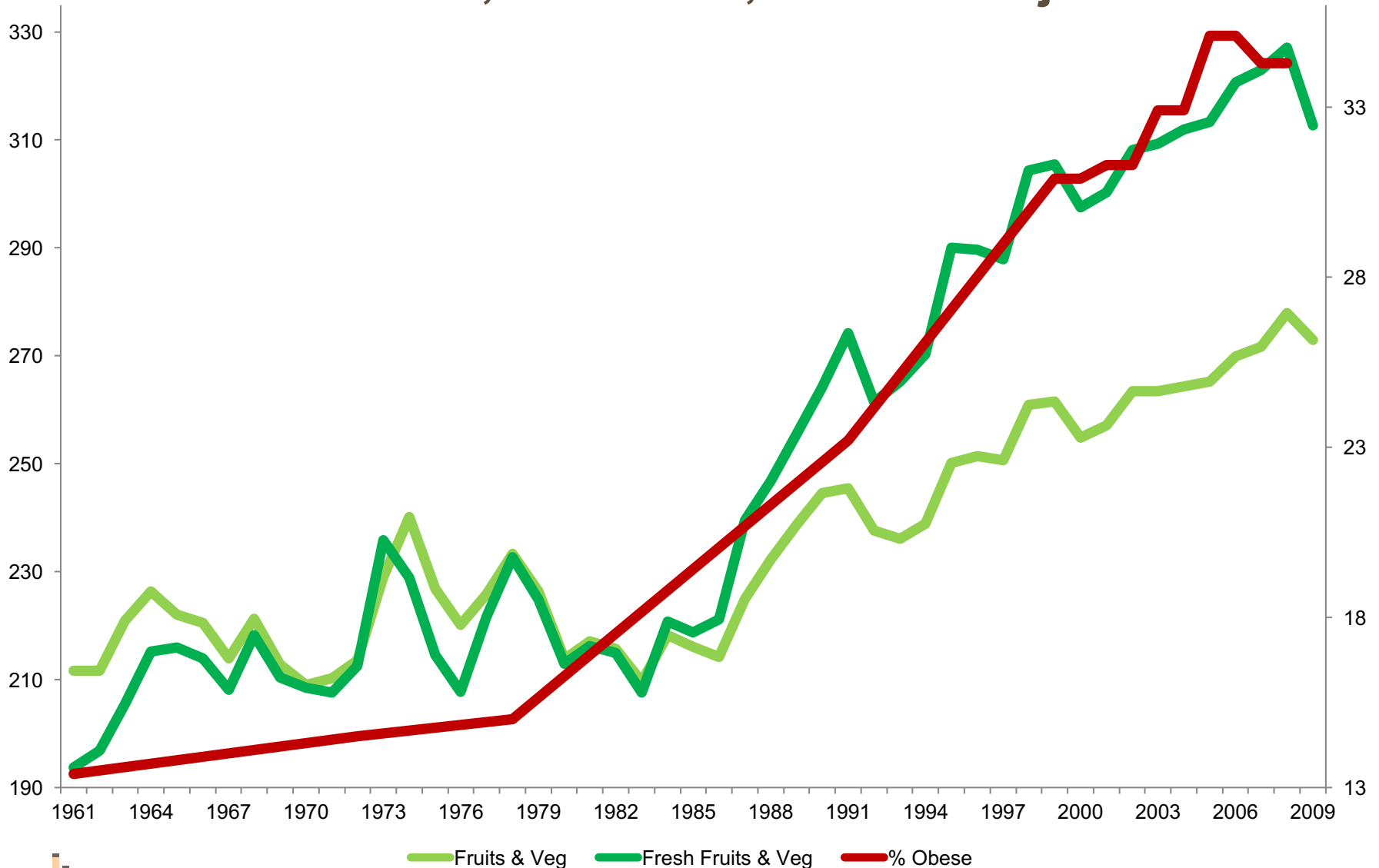
Source: Euromonitor, 2015, and author's calculations



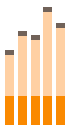
Taxes, Prices & Obesity

Selected Food Price & Adult Weight Trends

United States, 1961-2009, Inflation Adjusted

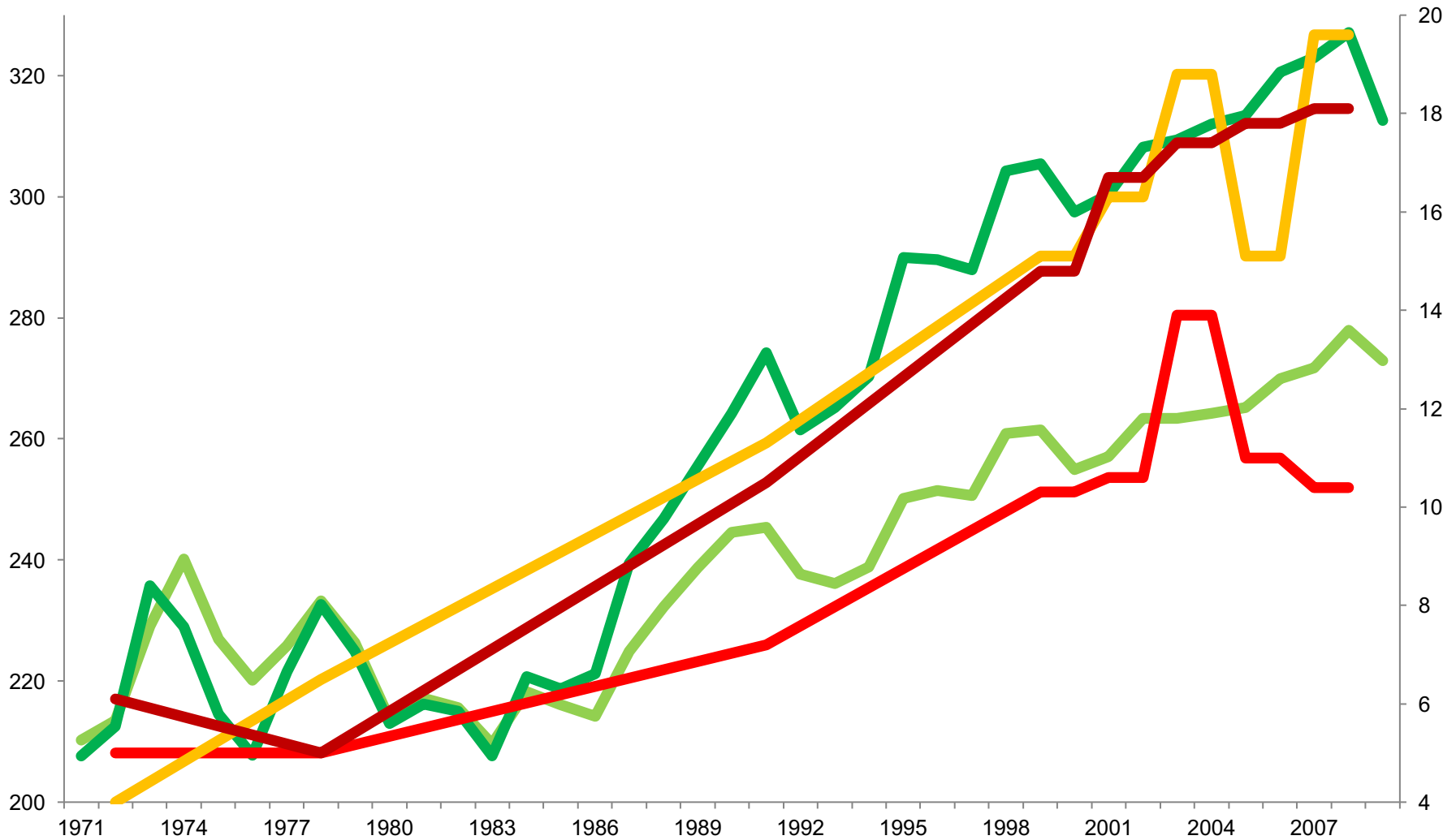


Source: BLS; NHES-I 1960-62; NHANES, 1971-74, 1976-80, 1988-94, 1999-2000, 2001-02, 2003-04, 2005-06, 2007-08



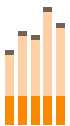
Selected Food Price & Youth Weight Trends

United States, 1971-2009, Inflation Adjusted



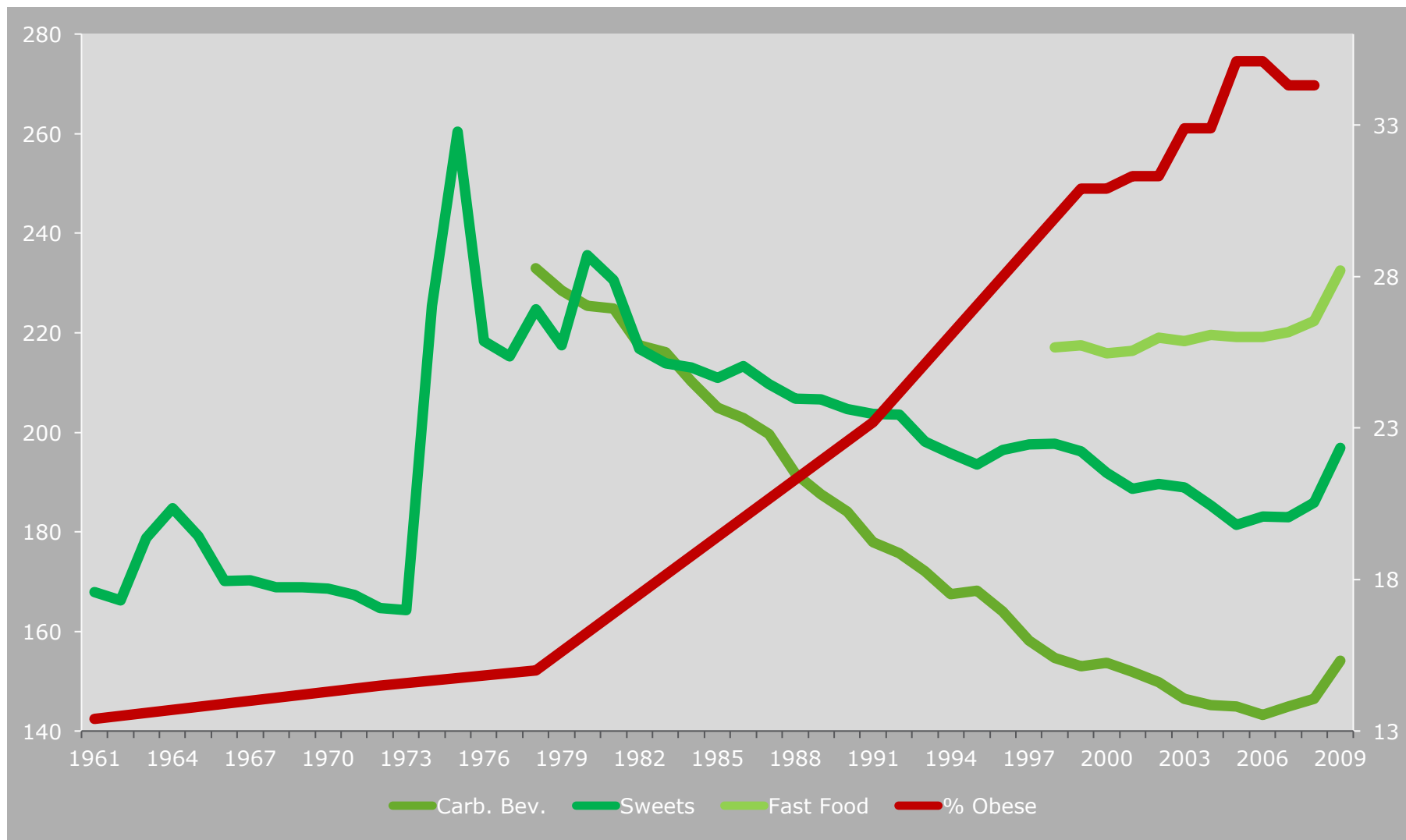
— Fruits & Veg
 — Fresh Fruits & Veg
 — 2-5
 — 6-11
 — 12-19

Source: BLS; NHES-I 1960-62; NHANES, 1971-74, 1976-80, 1988-94, 1999-2000, 2001-02, 2003-04, 2005-06, 2007-08

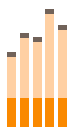


Selected Food Price & Adult Weight Trends

United States, 1961-2009, Inflation Adjusted

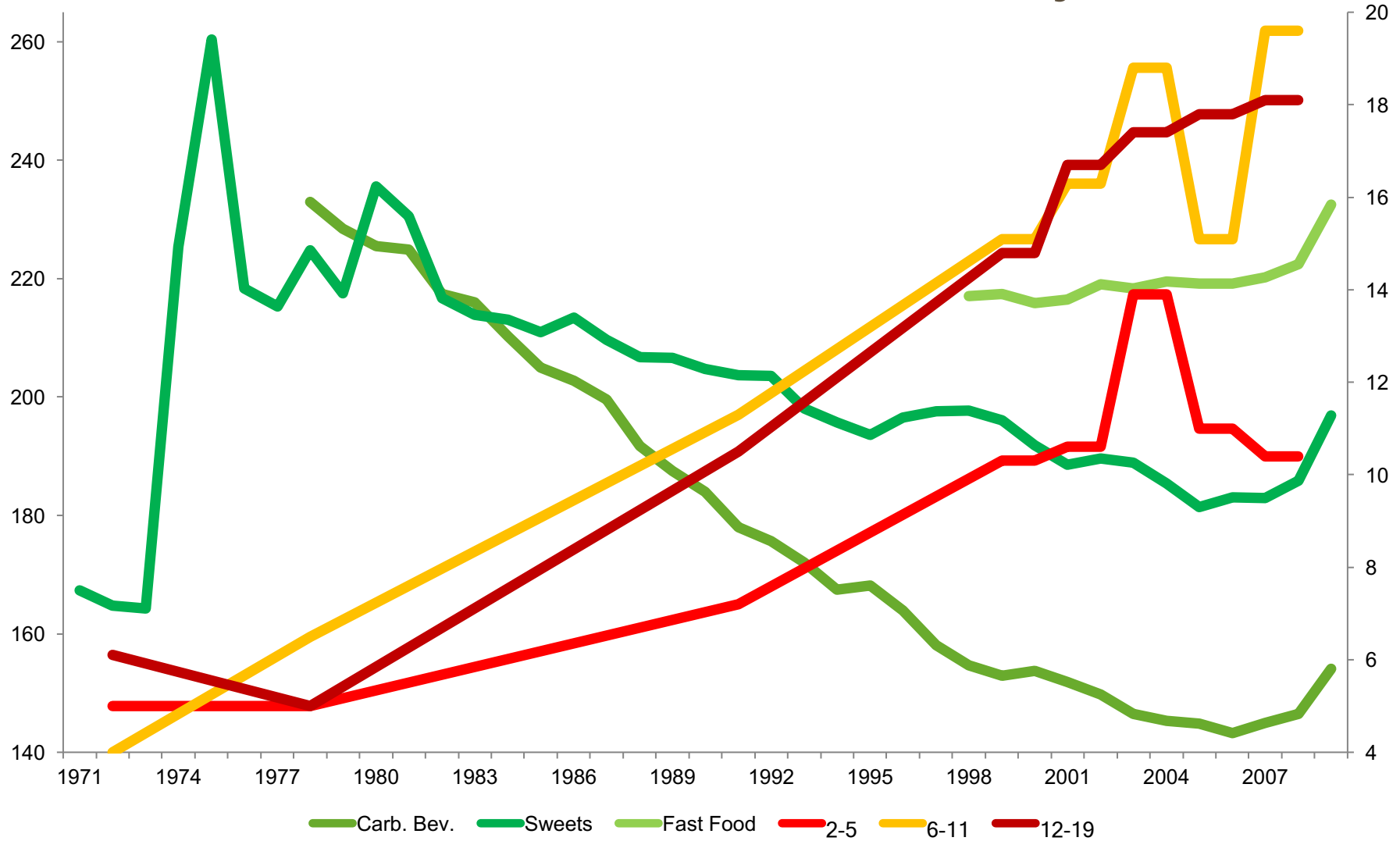


Source: BLS; NHES-I 1960-62; NHANES, 1971-74, 1976-80, 1988-94, 1999-2000, 2001-02, 2003-04, 2005-06, 2007-08

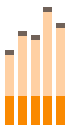


Selected Food Price & Youth Weight Trends

United States, 1971-2009, Inflation Adjusted



Source: BLS; NHES-I 1960-62; NHANES, 1971-74, 1976-80, 1988-94, 1999-2000, 2001-02, 2003-04, 2005-06, 2007-08



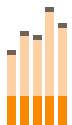
Prices and Weight Outcomes

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

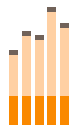


Prices and Weight Outcomes

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

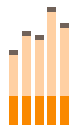
Source: Powell, et al., 2013

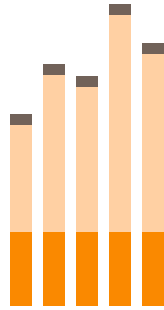


Prices and Weight Outcomes

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

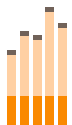




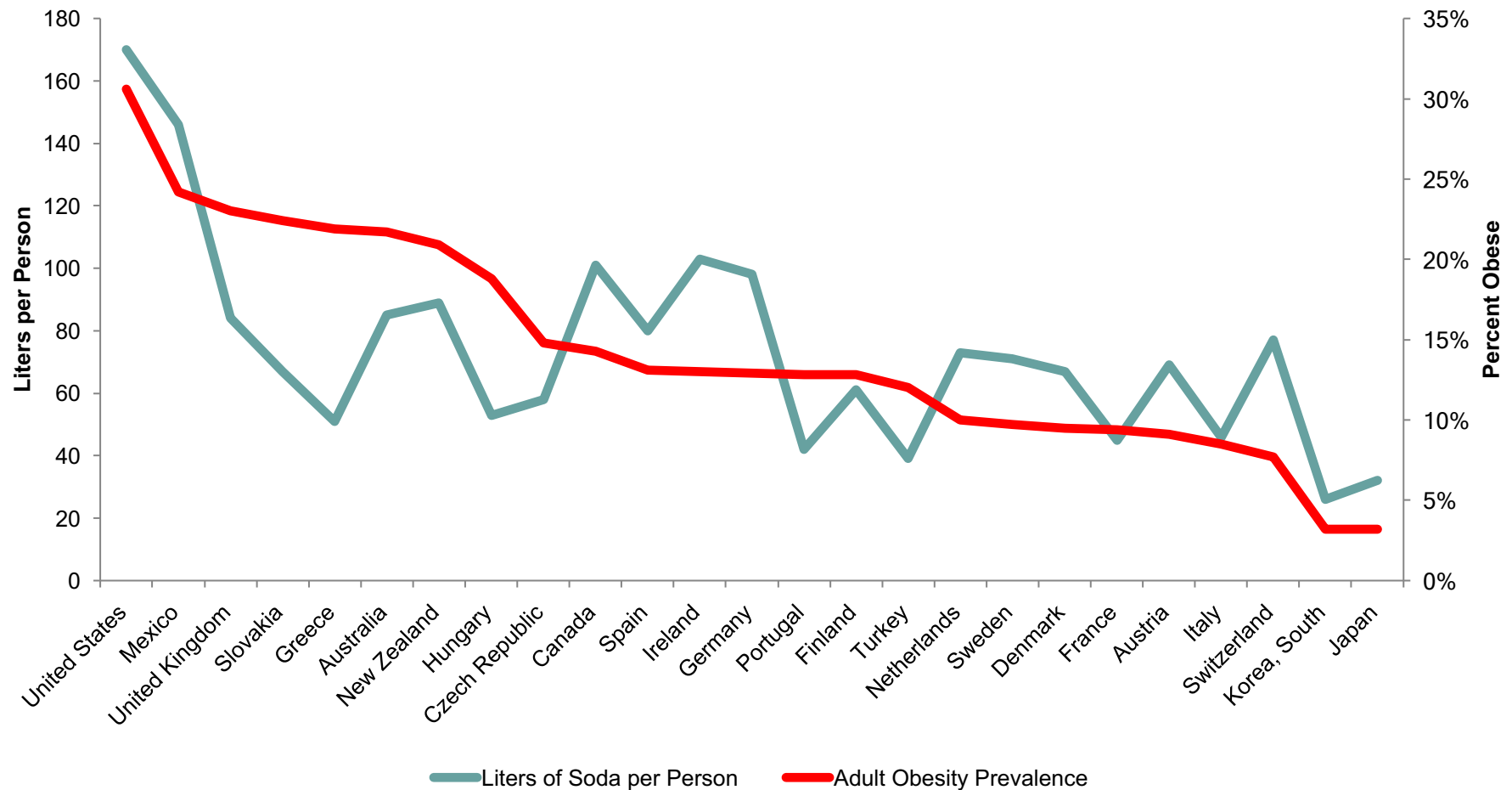
Sugary Beverage Taxes

Rationale for SSB Taxes

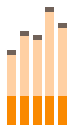
- Link to obesity
 - Several meta-analyses conclude that increased SSB consumption causes increased weight, obesity
 - Increased calories from SSBs not offset by reductions in calories from other sources
- Other health consequences
 - Type 2 diabetes, lower bone density, dental problems, headaches, anxiety and sleep disorders



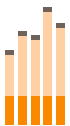
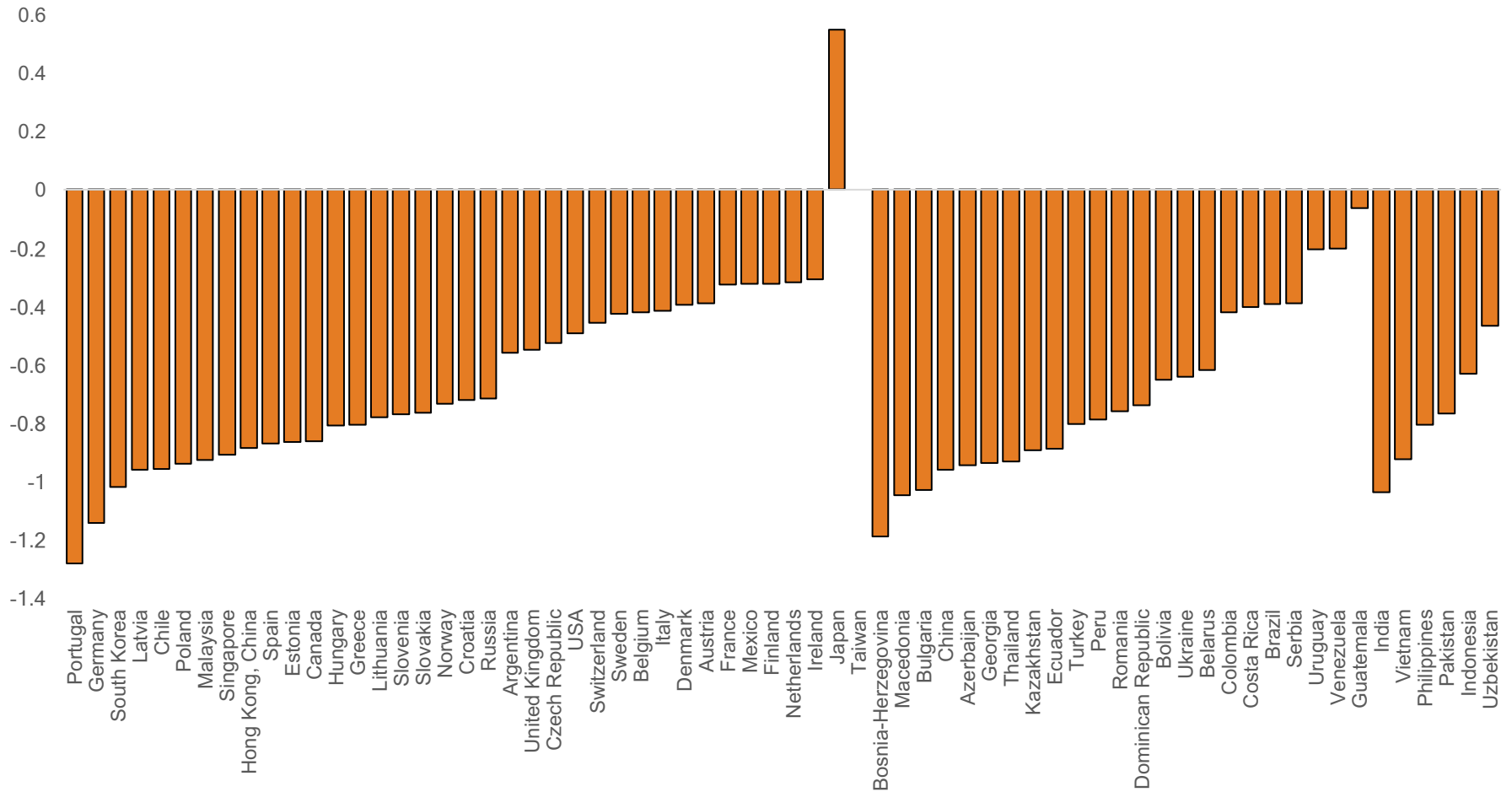
Soda Consumption & Obesity Selected Countries



Source: Soda consumption from Euromonitor, 2011; Obesity prevalence from OECD Health Data, 2005



Change in Soft Drink Affordability 2000-2013, Selected Countries



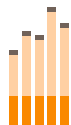
Source: Euromonitor, 2015, and author's calculations

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

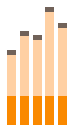


Soda Taxes in Mexico

Evidence from Mexico's peso per liter SSB tax;

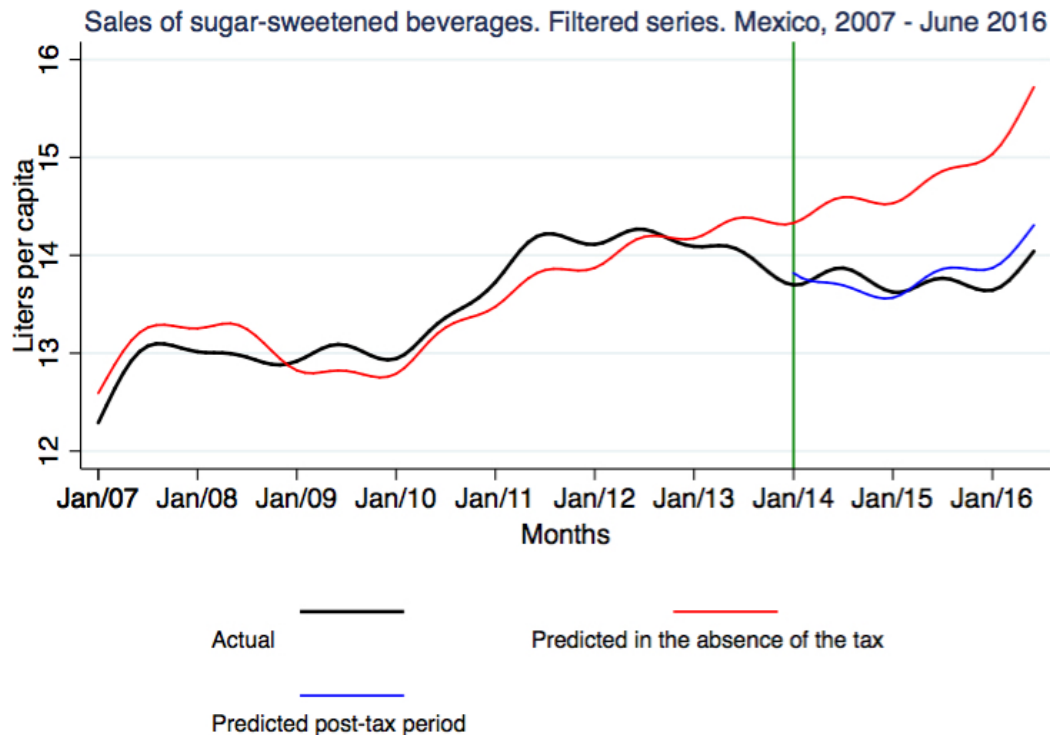
- Increased prices for SSBs relative to non-taxed beverages
 - pass through varies by type, size, location
- Significant reduction in SSB sales, consumption
 - growing over time
- Significant increase in bottled water consumption
- Greater impact on heavier consumers, low-income population

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

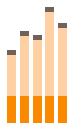


Impact on SSB sales consistent with reductions in purchases:

- **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

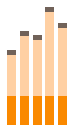
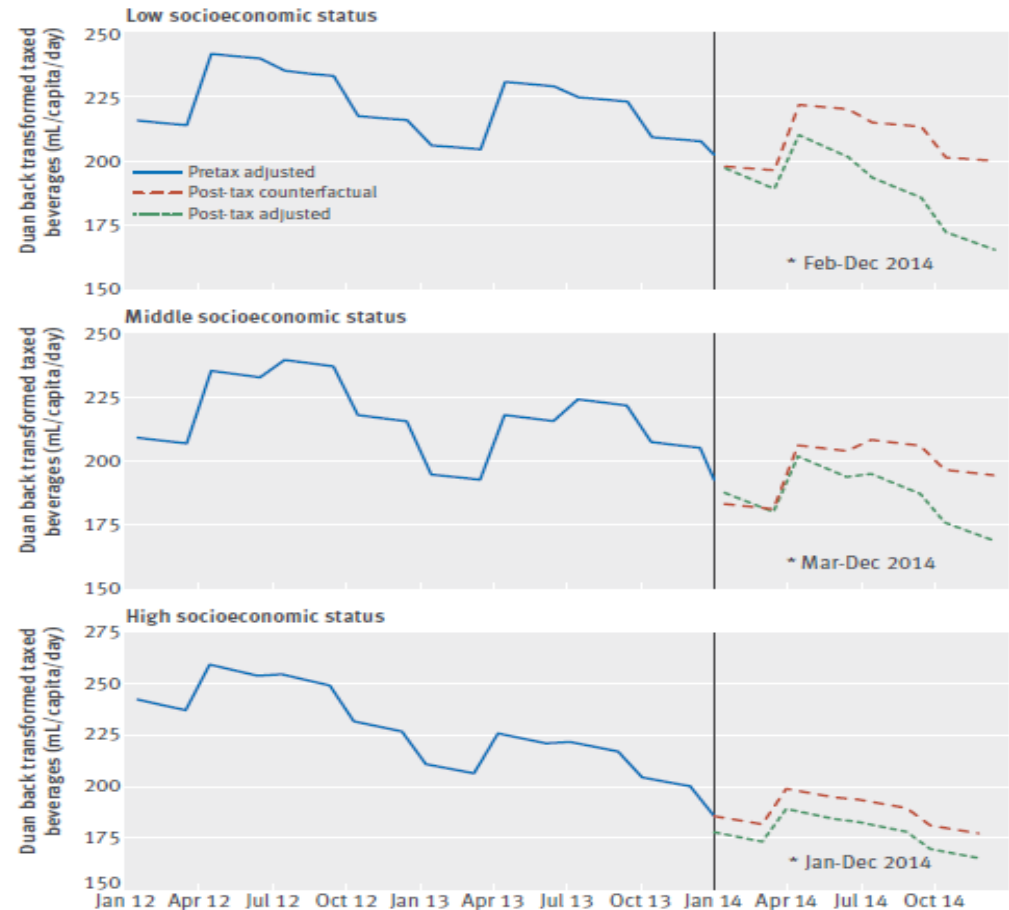


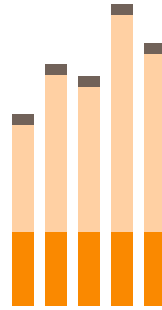
Colchero MA, Guerrero Lopez C, Molina M, Rivera J . Beverage sales in Mexico before and after implementation of a sugar sweetened beverages tax. 2016. PLoS ONE. 11(9).

Changes in sales of sugar-sweetened beverages in Mexico before (2007-2013) and after the tax (2014-2016): <https://www.insp.mx/epppo/blog/4278-changes-sales-beverages.html>

Impact of Tax on Purchases Year One (2014)

- Purchases of taxed beverages reduced in all SES groups
- Reductions in purchases **greatest among lowest SES households**
 - **9% decline in 2014**



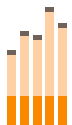


Oppositional Arguments

Food & Beverage Tax Policy

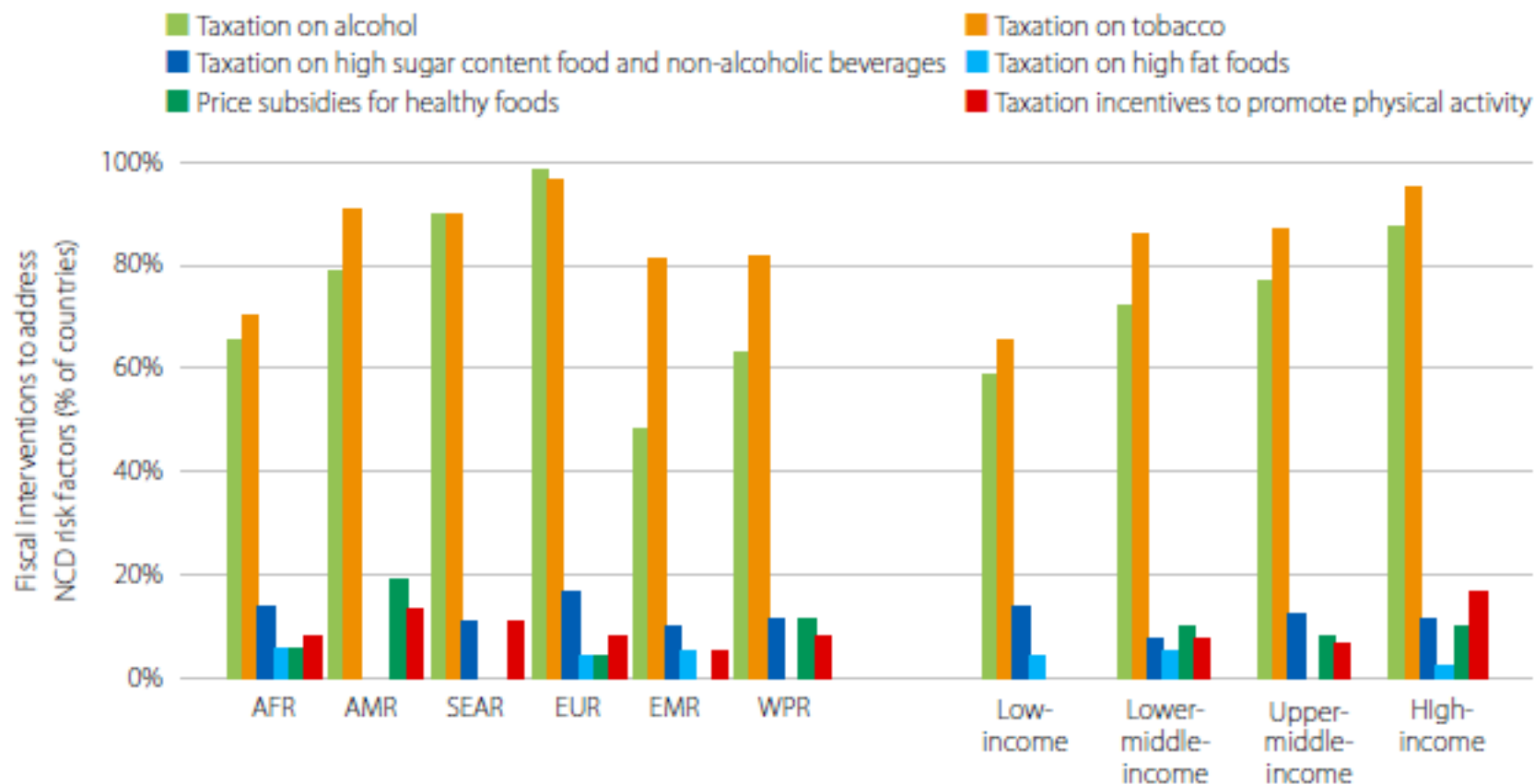
To date, relatively few governments have adopted significant taxes in efforts to promote healthier eating, reduce obesity:

- 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

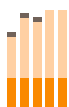


Fiscal Policy & NCDs

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

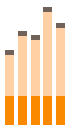


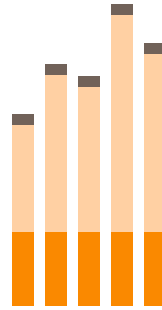
AFR=African Region, AMR=Region of the Americas, SEAR=South-East Asia Region, EUR=European Region, EMR=Eastern Mediterranean Region, WPR=Western Pacific Region



Common Oppositional Arguments

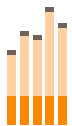
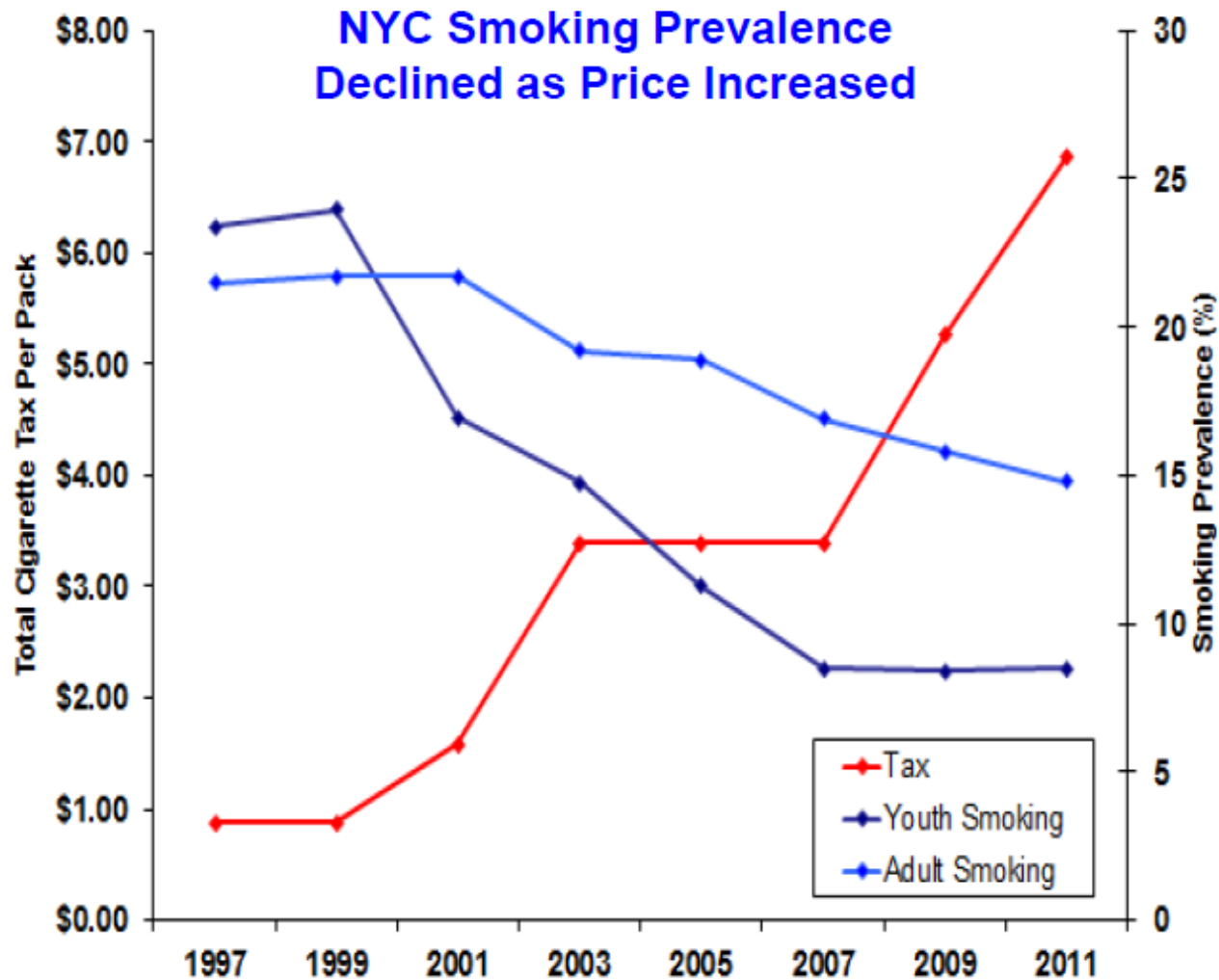
- Industries and allies use several common arguments in opposition to tax increases:
 - Won't have the intended impact in terms of reducing use and consequences
 - Will lead to extensive tax avoidance and tax evasion
 - Will harm poor and working class consumers
 - Will lead to massive job losses





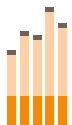
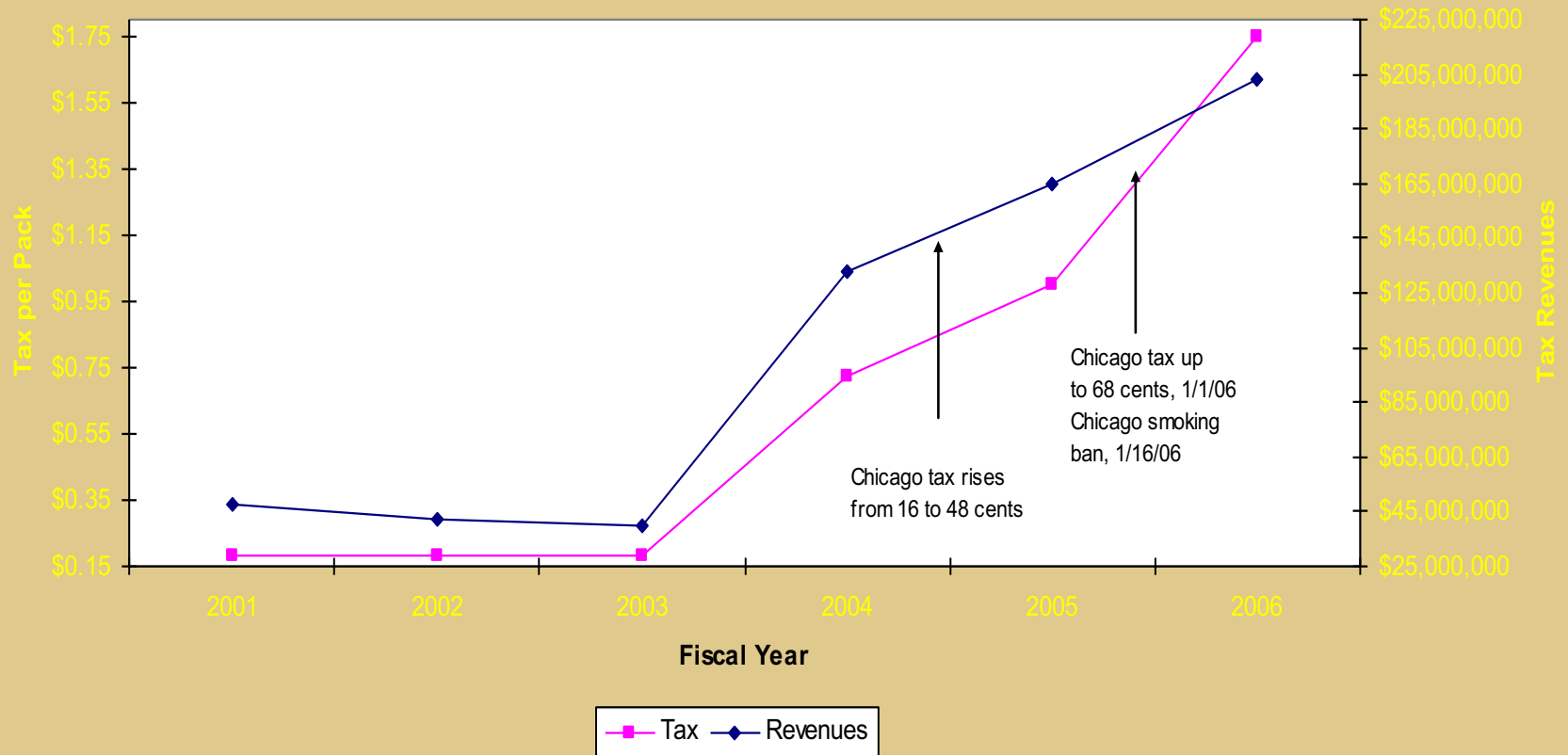
Tax Avoidance & Evasion

Tax Avoidance & Evasion Do NOT Eliminate Health Impact of Higher Taxes

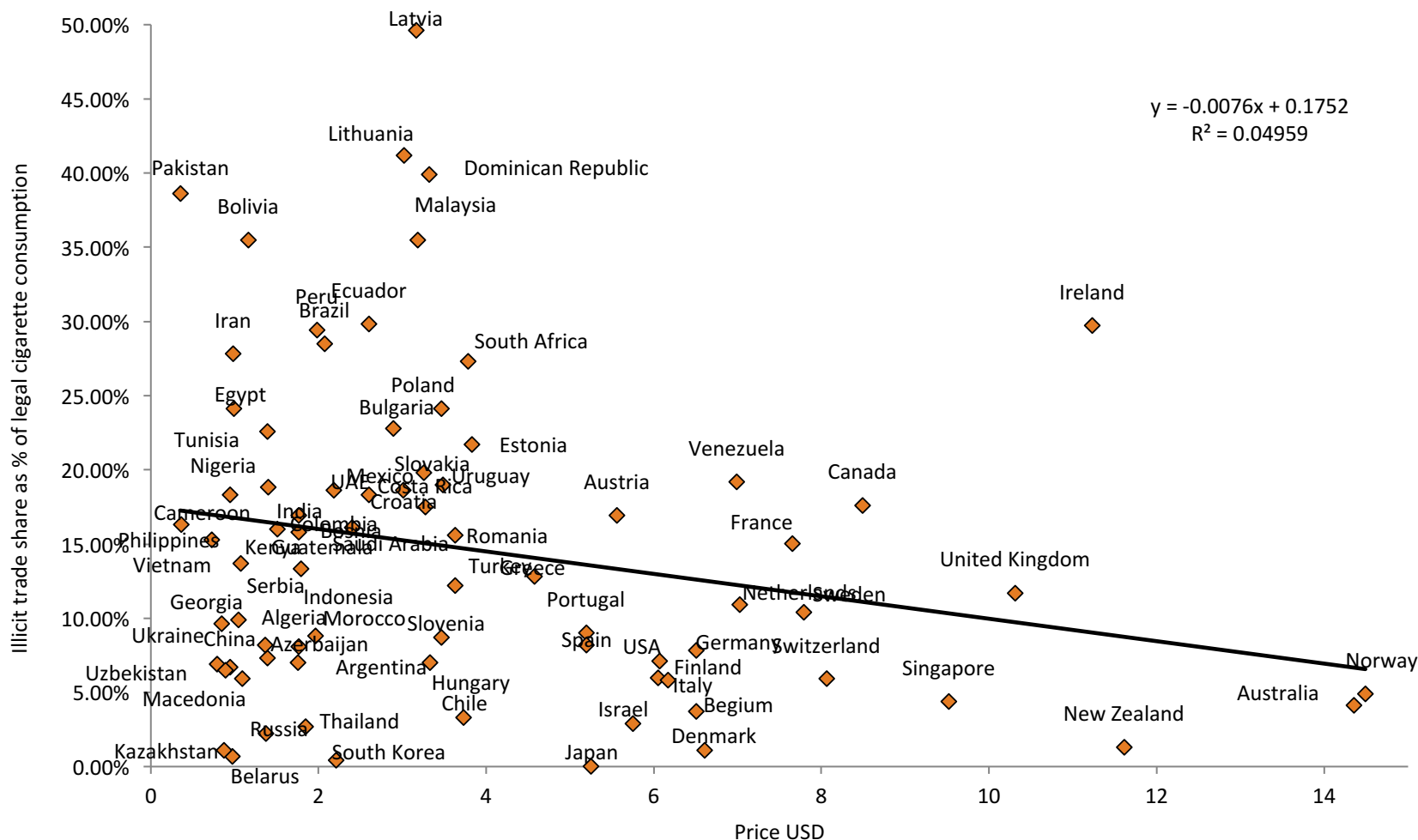


Tax Avoidance & Evasion Do NOT Eliminate Revenue Impact of Higher Taxes

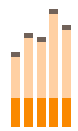
Cook County Cigarette Tax and Tax Revenues - FY01-FY06



Illicit Cigarette Market Share & Cigarette Prices, 2012



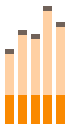
Sources: Euromonitor, WHO



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



Sources: Euromonitor, Transparency International

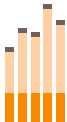
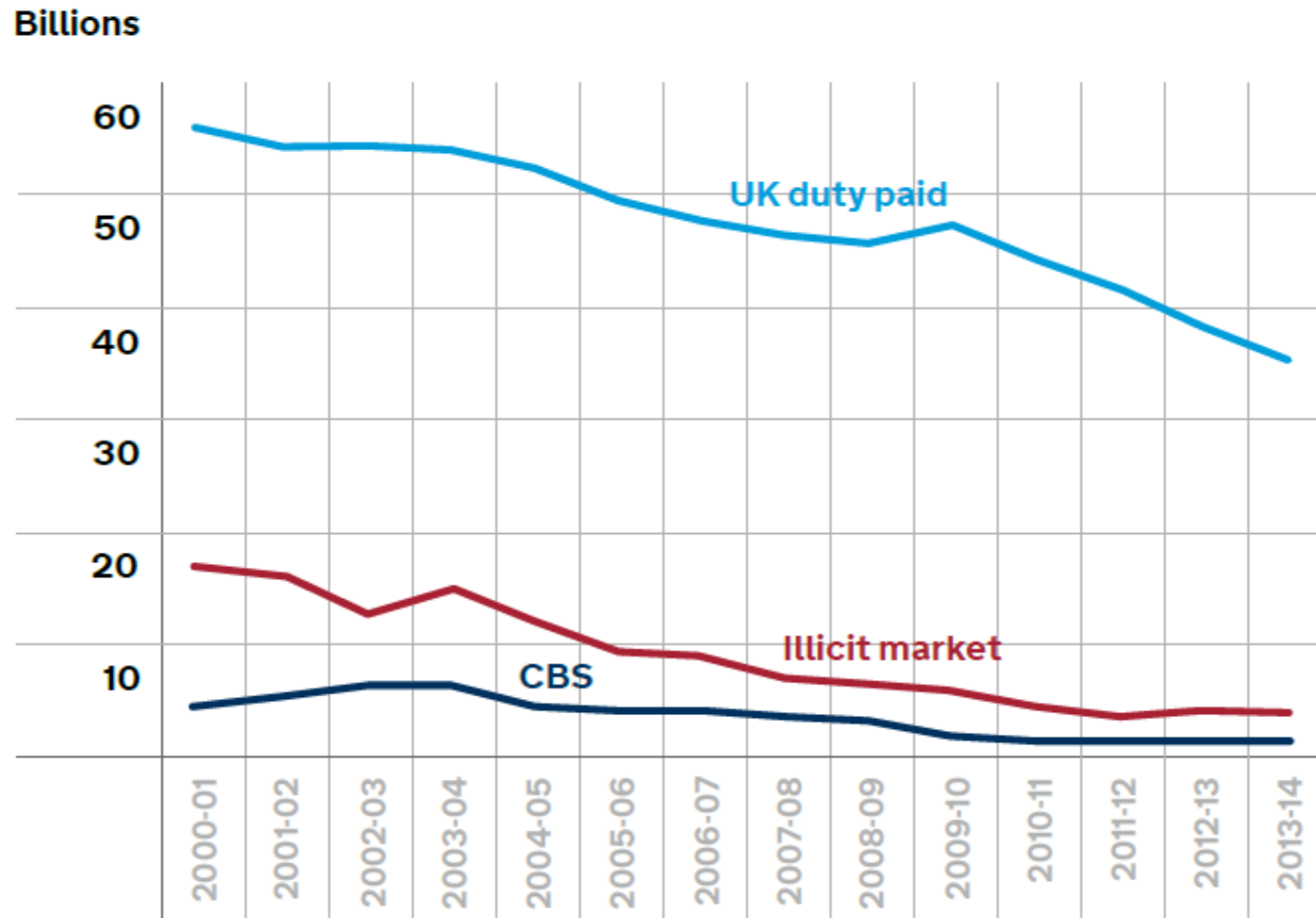
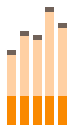


Figure 12 – Estimated Volumes of Cigarettes Consumed in the U.K. – Duty paid, illicit, and cross-border shopping, 2000-01 – 2013-14

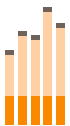


Source: HM Revenue & Customs, 2014



Combating Illicit Tobacco Trade

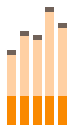
- Illicit trade protocol to the WHO FCTC
 - Adopted November 2012; currently in process of being signed/ratified; provisions calling for:
 - Strong tax administration
 - Prominent, high-tech tax stamps and other pack markings
 - Licensing of manufacturers, exporters, distributors, retailers
 - Export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



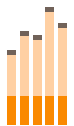
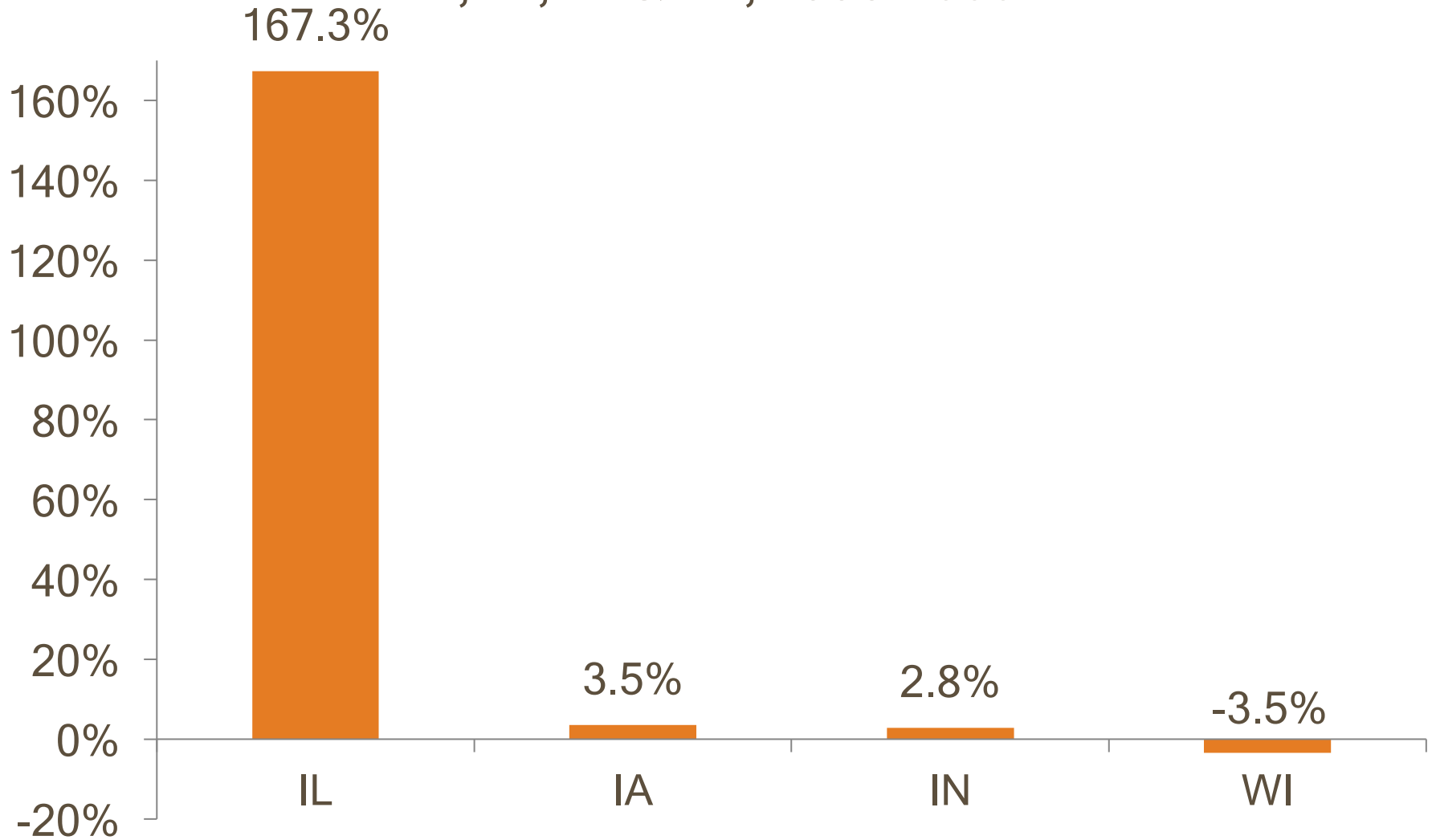
Beverage Tax Avoidance & Evasion

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

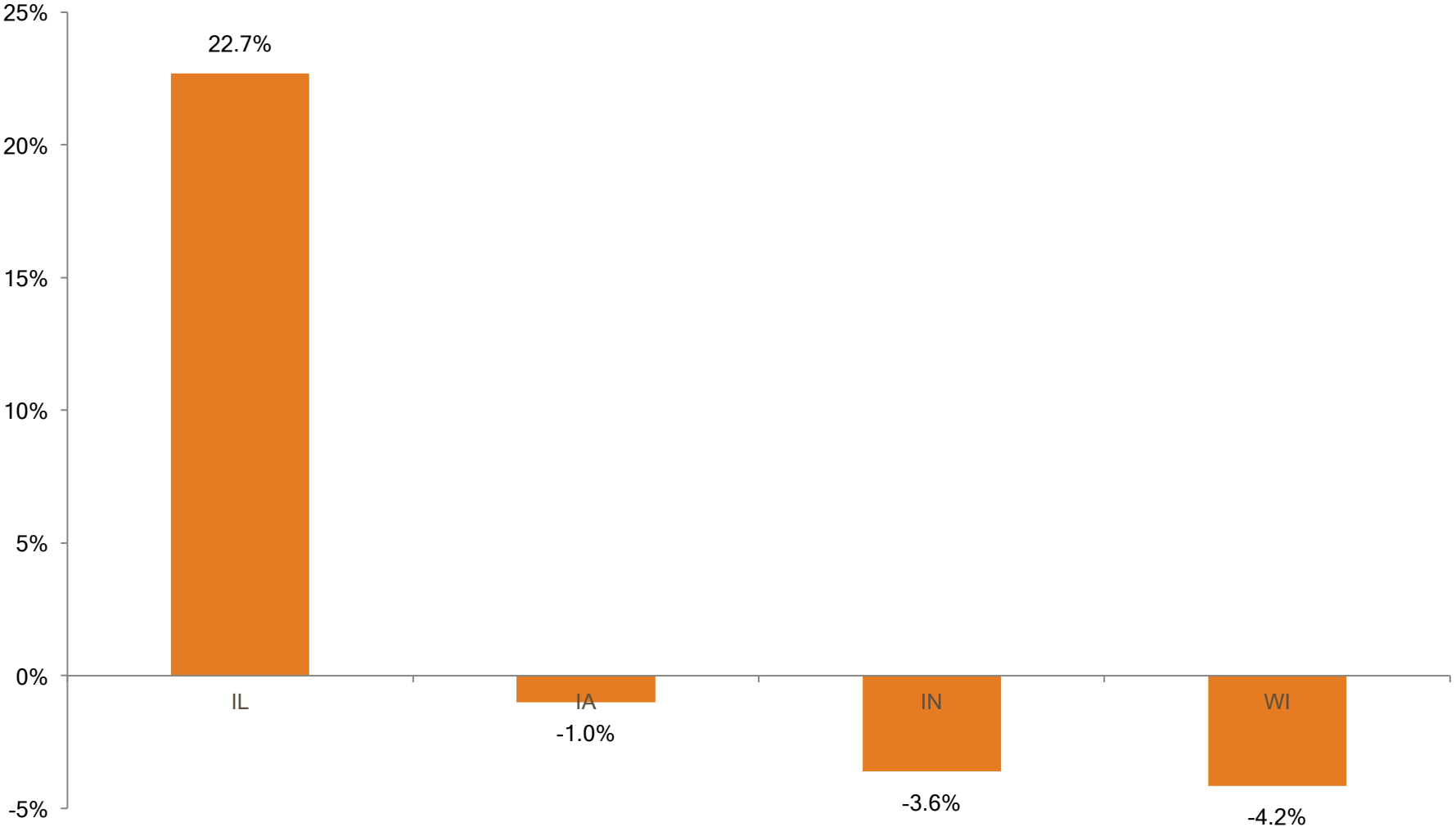


Percent Change in State Beer Taxes Revenues, IL, IN, IA & WI, 1998-2000

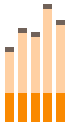


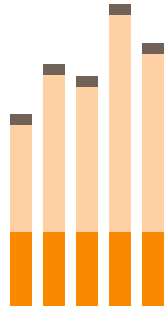
Source: *Brewers' Almanac*, 2013, and author's calculations

Percent Change in Beer Taxes Revenues IL, IA, IN, WI 2008-2010



Source: *Brewers' Almanac*, 2013, and author's calculations





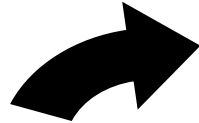
Impact on the Poor

Tobacco & Poverty

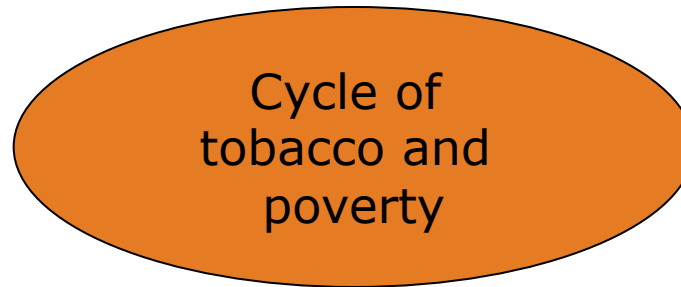
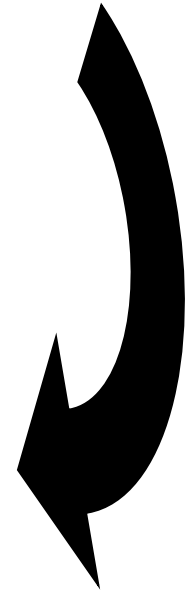
Family falls into poverty

Foregone income 3:

Breadwinner dies prematurely



Poor men smoke



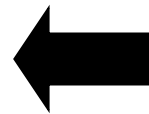
Cycle of tobacco and poverty

Foregone income 2:

Treatment cost & Lost working days & income



Breadwinner gets sick due to tobacco use

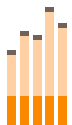


Foregone income 1:

More money spent on tobacco:

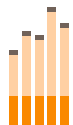
Less money spent on Education, nutrition etc

High opportunity cost

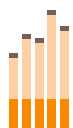
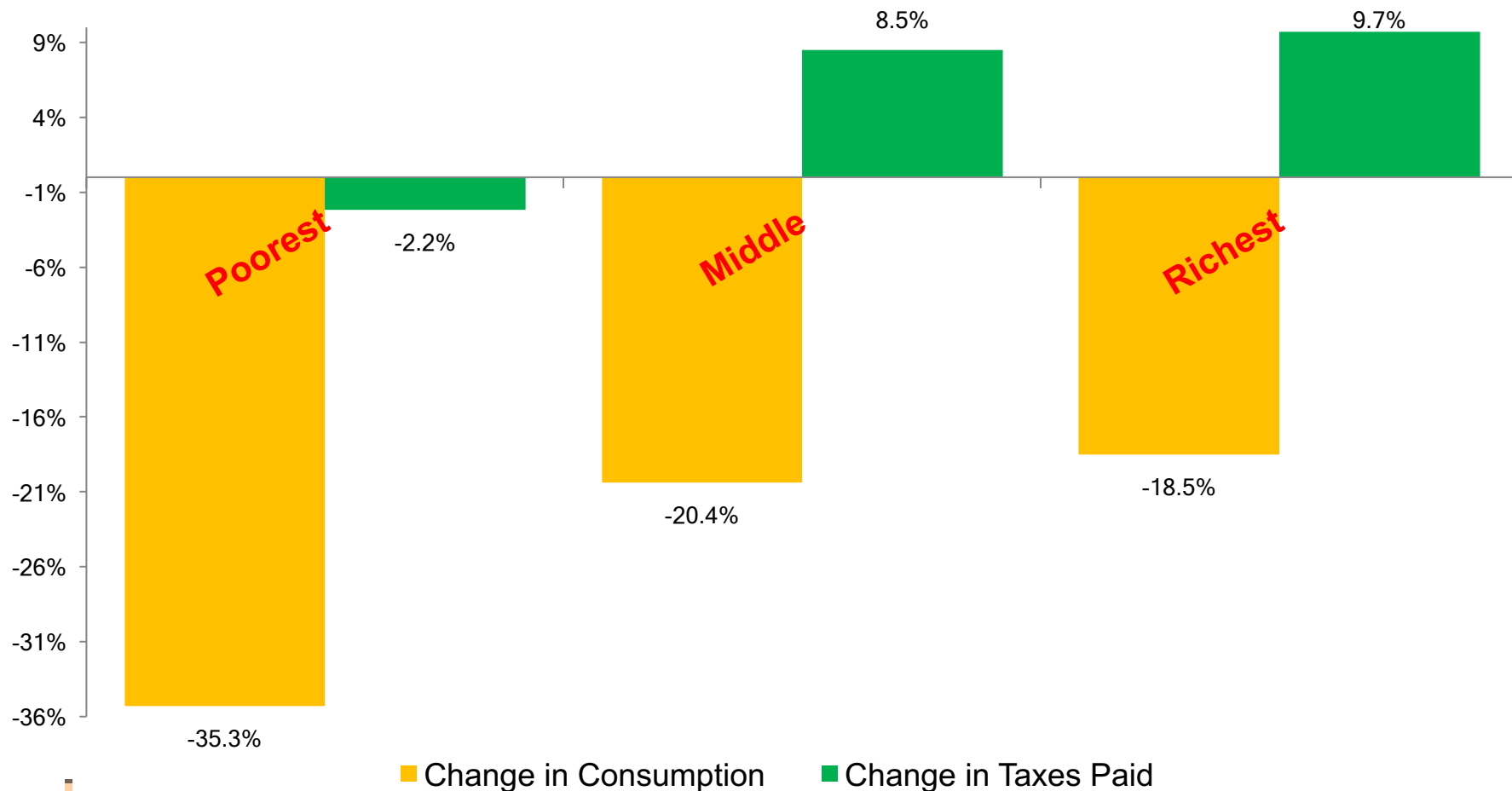


Impact on the Poor

- **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

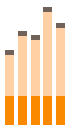


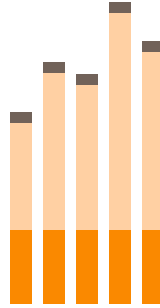
Who Pays & Who Benefits Turkey, 25% Tax Increase



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



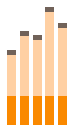


Impact on the Economy

Excise Taxes and Jobs

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

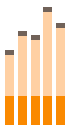
- employment in farming, manufacturing, distribution, retailing, and related sectors
- multiplier effects as income earned in these jobs is spent on other goods & services



Excise Taxes and Jobs

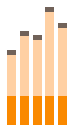
Industry-sponsored studies tell only part of story:

- 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

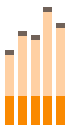
- Many published studies assess impact of reductions in tobacco use from tax increases and/or other tobacco control measures:
 - Variety of high, middle, and low income countries
 - Use alternative methodologies
- Generally find that employment losses in tobacco sector more than offset by gains in other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



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

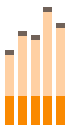
Sugar-sweetened beverages (SSBs) are the leading source of added sugar in the American diet and are associated with increased risk of type 2 diabetes, cardiovascular disease, dental caries, osteoporosis, and obesity.¹⁻⁴ From 1988-1994 to 1999-2004, average daily caloric intake of SSBs increased from 157 to 203 kilocalories among adults and from 204 to 224 kilocalories among children aged 2 to 19 years.^{5,6} 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.^{2,7} 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

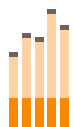
Estimated impact of tax increases in Illinois

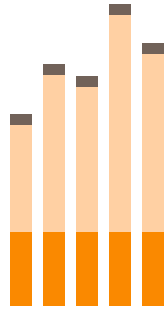
Effects on Employment

Potential Impact of Alcohol Tax Increases on Jobs

Tax/Drink	General Fund	Healthcare
\$0.05	2530	877
\$0.10	4894	1694
\$0.25	11204	3863
Sales Tax		
5%	2371	610

<http://www.camy.org/research-to-practice/price/alcohol-tax-tool/>

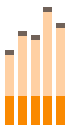




Summary

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>

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fjc@uic.edu

