

**tobacconomics**

Economic Research Informing Tobacco Control Policy

# The Economics of Addiction

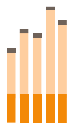
Frank J. Chaloupka, University of Illinois at Chicago

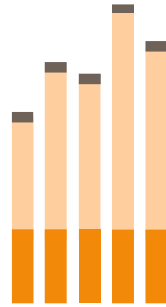
Annual Meetings of the Pakistan Society of Development Economists

Islamabad, Pakistan, 13 December 2018

# Overview

- Economic models of demand for addictive products
- Impact of taxes/prices on demand for addictive and/or unhealthy products
- Myths & Facts on economic “costs” of tobacco control
- Ongoing activities



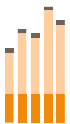


# Economic Models of Demand for Addictive Goods

# Standard Demand Models

$$C(t) = \alpha_0 + \alpha_1 P(t) + X(t)\Gamma$$

- Ignore the factors that distinguish addictive goods from other consumer goods:
  - Tolerance – body’s adaptation to consumption of addictive substance
  - Reinforcement – learned response to consumption and associated rewards
  - Withdrawal – disutility from cessation or interruption of consumption



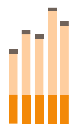
# Myopic Addiction Models

$$C(t) = \alpha_0 + \alpha_1 P(t) + \pi S(t) + \mathbf{X}(t)\Gamma$$

- Captures the intertemporal dependence that characterizes addictive goods through  $S(t)$  – the stock of past consumption

$$S(t) = C(t-1) + (1-\delta)S(t-1)$$

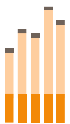
- But backward-looking only; does not allow for forward-looking behavior
  - e.g. response to new information about health consequences of addictive behavior



# Rational Addiction Models

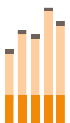
$$C(t) = \alpha_0 + \alpha_1 P_C(t) + \alpha_2 P_C(t-1) + \beta \alpha_2 P_C(t+1) \\ + \alpha_3 C(t-1) + \beta \alpha_3 C(t+1) + \mathbf{X}(t)\Gamma$$

- Captures the intertemporal dependence that characterizes addictive goods through past consumption, price
- Allows for forward looking behavior through future consumption, price, where  $\beta=1/(1+\sigma)$
- More challenging empirically given endogeneity of past and future consumption



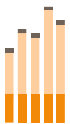
# Rational Addiction Models

- Several policy relevant, empirically testable predictions
  - Populations with lower rates of time preference (e.g. youth, less educated) respond more to monetary price than those with higher rates of time preference
  - Populations with higher rates of time preference respond more to information about long term health consequences than those with lower rates of time preference
  - Permanent price changes have greater impact than temporary price changes
  - Anticipated price changes have greater impact than unanticipated price changes
  - Long run price elasticity greater than short run price elasticity



# Rational Addiction Models

- Chaloupka (1988, 1990, 1991) – first empirical application of rational addiction model
  - Cigarette smoking in US
  - Long run price elasticity -0.27 to -0.48
    - About double estimates from standard demand models
  - Demand among younger populations less inelastic than among older populations
  - Demand among less educated less inelastic than among more education

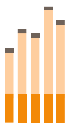




# Rational Addiction Models

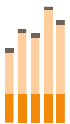
- Various aspects of RA model criticized:

“[T]he addict looks strange because he sits down at period  $j=0$ , surveys future income, production technologies, investment/addiction functions, and consumption preferences over his lifetime to period  $T$ , maximizes the discounted value of his expected utility, and decides to be an alcoholic. That's the way he will get the greatest satisfaction out of life. Alcoholics are alcoholics because they want to be alcoholics, *ex ante*, with full knowledge of its consequences.” (Winston, 1980)



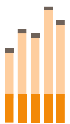
# Rational Addiction Models

- Extensions to the RA model:
  - Uncertainty about future price, other costs
  - Learning and regret
  - Bounded rationality
  - Hyperbolic discounting and time inconsistent preferences



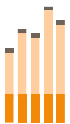
# Monetary Prices

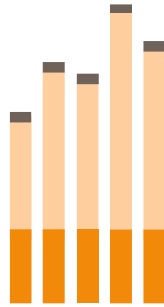
- Subsequently applied RA model to demand for alcoholic beverages, cocaine
  - Similar findings as for cigarette demand
    - Significant effects of price
    - Greater long run elasticity
    - Key subpopulations more responsive to price
- Relative addiction:
  - Comparing short and long run effects of price one way of assessing addictiveness of various substances
  - Estimates implied Cigarettes > Cocaine > Alcohol



# “Full Price”

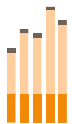
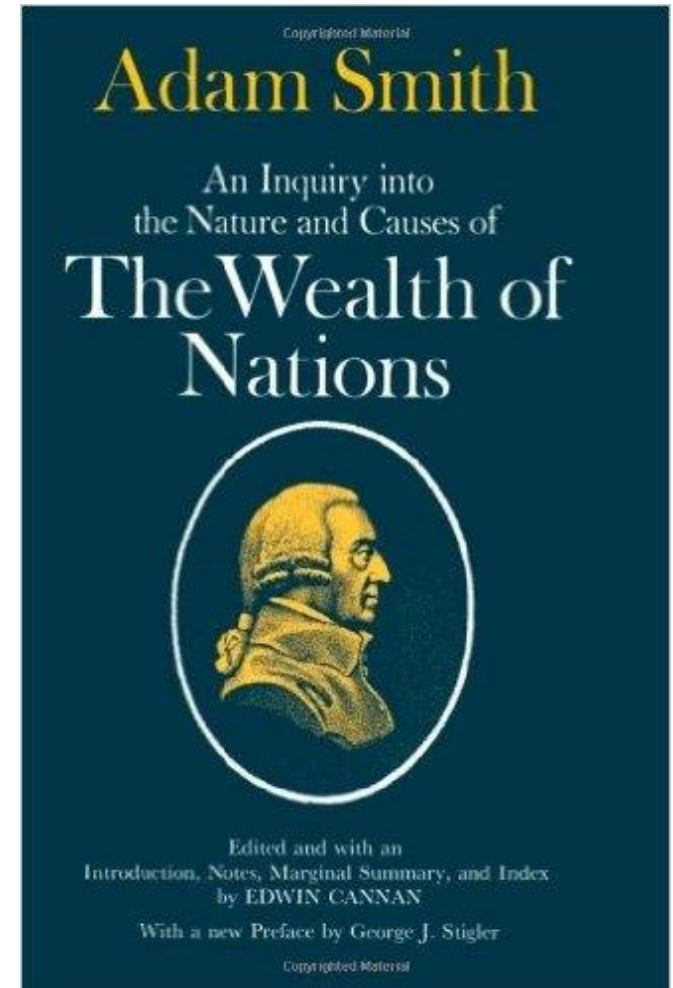
- Incorporates many factors in trying to capture the overall costs of using an addictive product
  - Monetary prices
  - Expected legal consequences
  - Perceived health consequences
  - Social norms
  - Time costs (availability)
  - Others.....

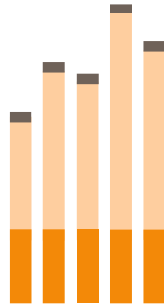




# Impact of Taxes & Prices on Addictive Behaviors

**" 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.****






# Impact of Tobacco Taxes & Prices on Tobacco Use

DEVELOPMENT IN PRACTICE

# Curbing the Epidemic

Governments and the  
Economics of Tobacco Control



A WORLD BANK PUBLICATION

The International Tobacco Control Policy Evaluation Project

## Tobacco Price and Taxation

ITC Cross-Country Comparison Report



MARCH 2012

UNIVERSITY OF WATERLOO

itc  
International Tobacco Control Policy Evaluation Project

International Agency for Research on Cancer  
World Health Organization

IARC HANDBOOKS OF CANCER PREVENTION  
Tobacco Control


Volume 14

Effectiveness of Tax and Price Policies for Tobacco Control

2011

# TOBACCO CONTROL

The Economics of Tobacco Control: Evidence from the International Tobacco Control (ITC) Policy Evaluation Project

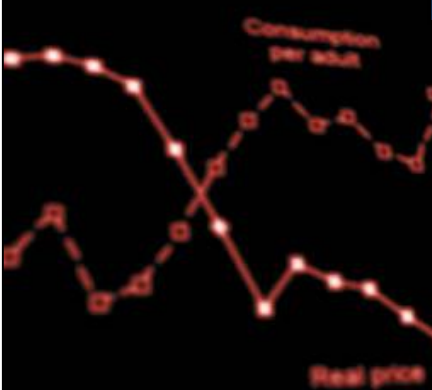


Guest Editor: John Taurus

itc  
International Tobacco Control Policy Evaluation Project

tobaccocontrol.bmj.com


BMJ



**Tobacco control in developing countries**

editors | Prabhat Jha | Frank Chaloupka

WHO Technical Manual on  
**Tobacco Tax Administration**



World Health Organization

### The Economics of Tobacco and Tobacco Taxation in the Philippines

Stella Luz A. Guimbo <small>unicon foundation</small>	Adelle A. Casoria <small>unicon foundation</small>
Martina Miguel-Baquillo <small>department of health</small>	Felipe M. Medalla <small>unicon foundation</small>
Xin Xu <small>university of alabama at birmingham</small>	Frank J. Chaloupka <small>university of alabama at birmingham</small>

"Eliminating the price classification freeze and applying a uniform specific tax of 28.30 pesos per pack, which is further indexed for inflation, could avert over 3.5 million premature deaths in the current population while raising 53.8 billion pesos (US\$ 1.2 billion) annually in excise tax revenues."

One of a series of reports on tobacco taxation funded by Bloomberg Philanthropies and the Bill and Melinda Gates Foundation as part of the Bloomberg Initiative to Reduce Tobacco Use.

NIH NATIONAL CANCER INSTITUTE

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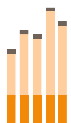
NCI TOBACCO CONTROL MONOGRAPH SERIES

## The Economics of Tobacco and Tobacco Control

IN COLLABORATION WITH  
WORLD HEALTH ORGANIZATION

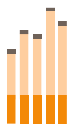
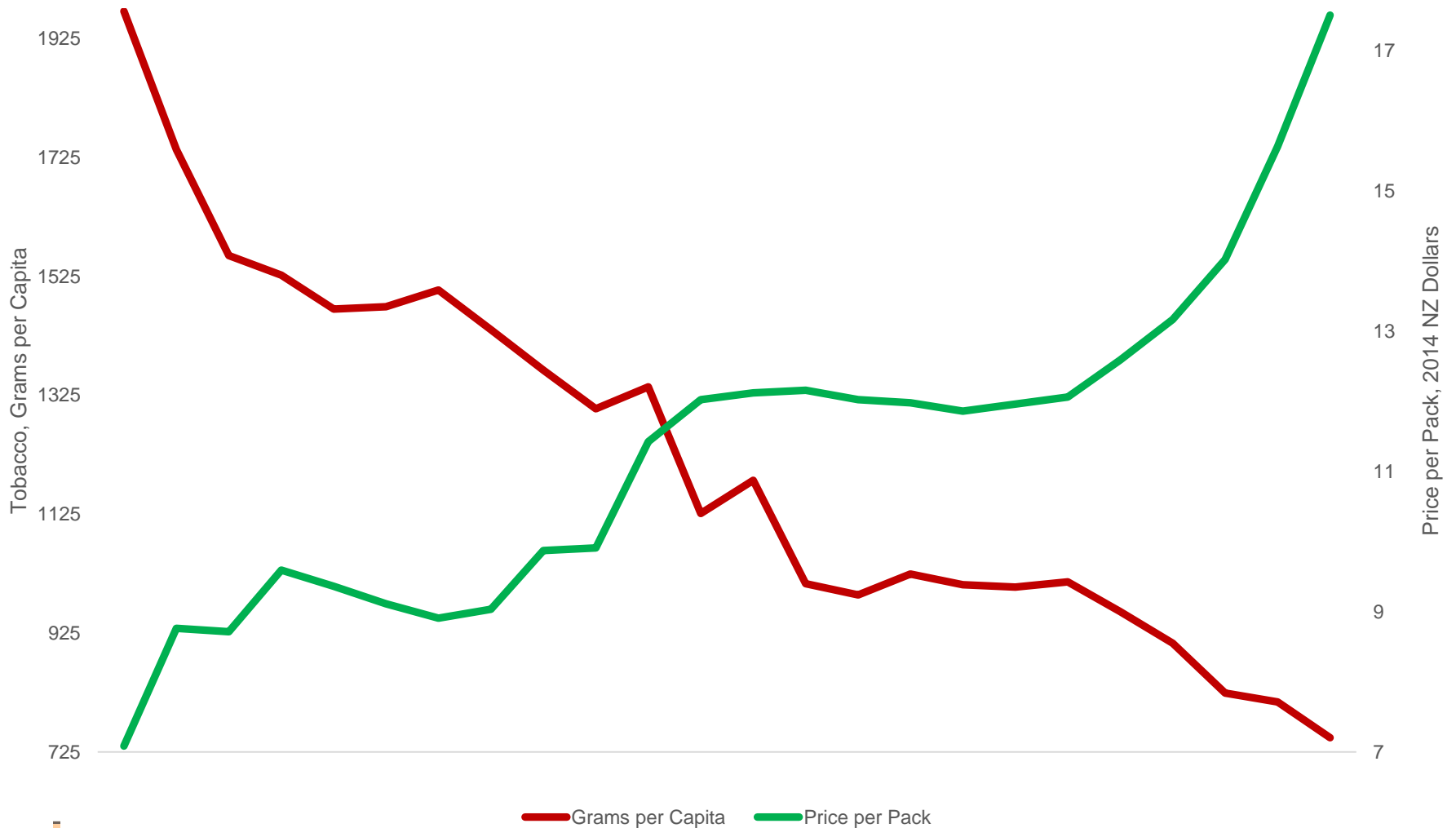
Executive Summary

U.S. Department of Health & Human Services | National Institutes of Health



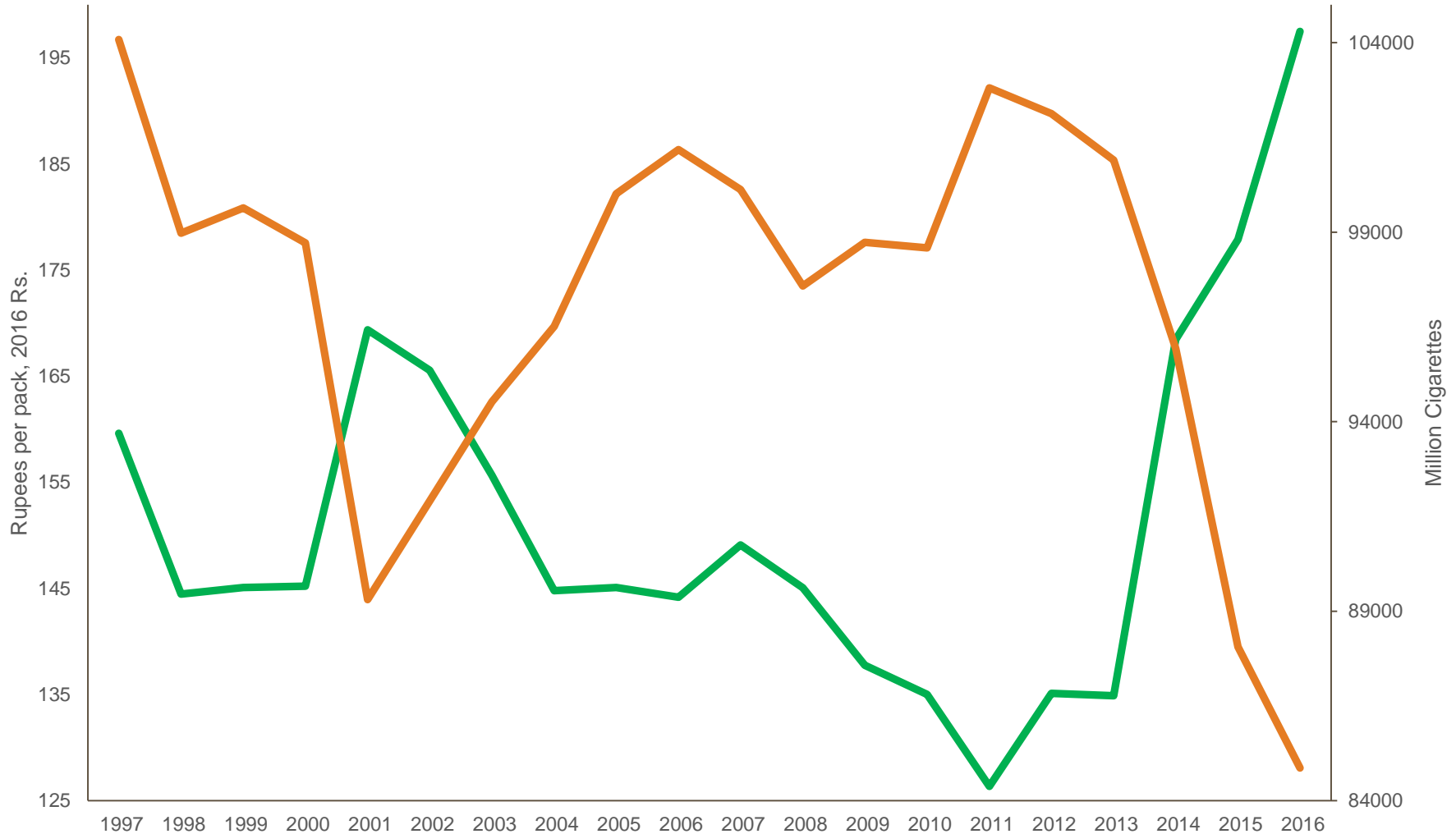


# Tobacco Consumption and Cigarette Prices New Zealand, 1990-2013, Inflation Adjusted



# Cigarette Price & Sales

## India, 1997-2016, Inflation Adjusted

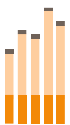
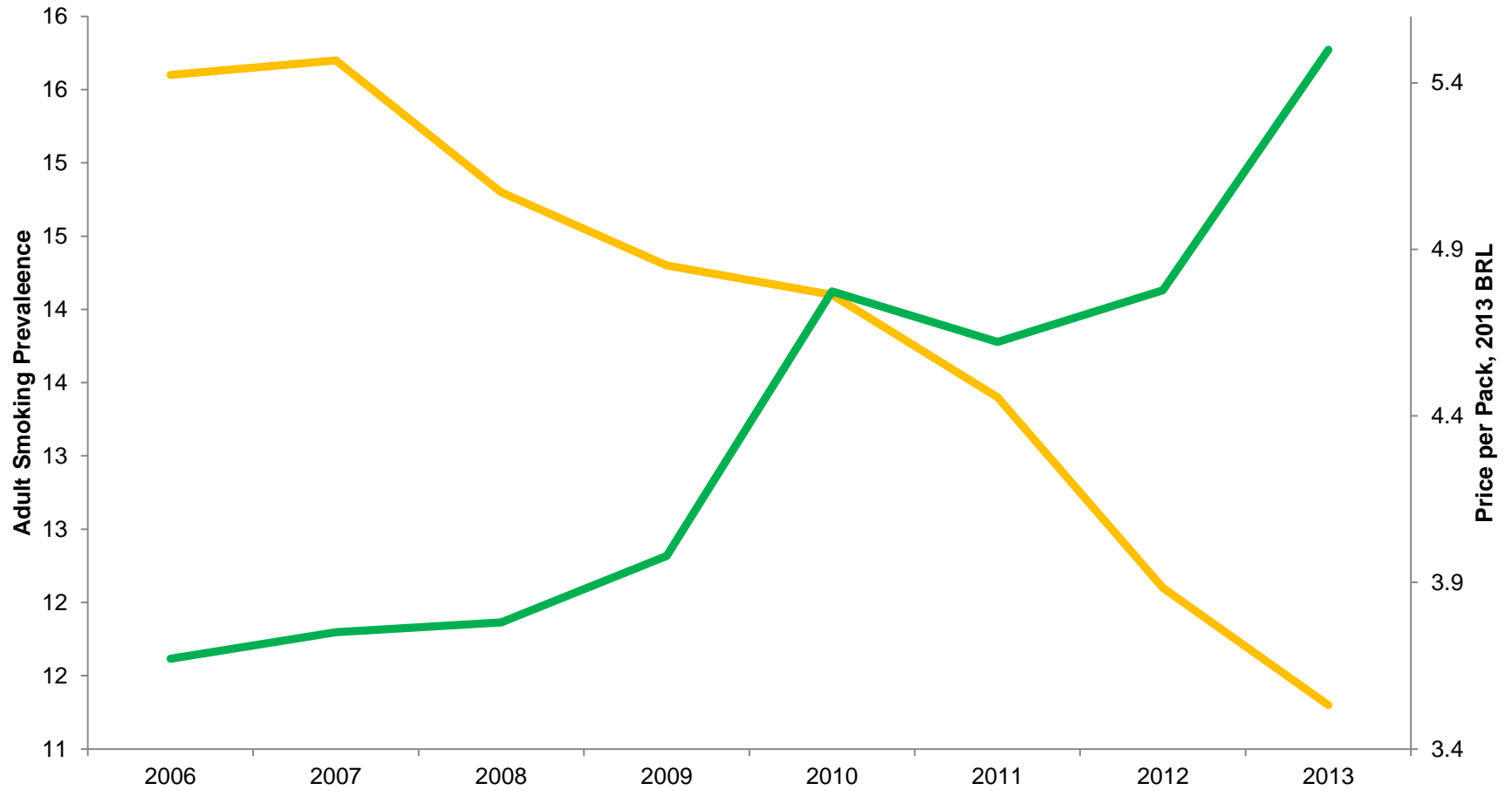


Sources: EIU, ERC, and World Bank and author's calculations

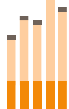
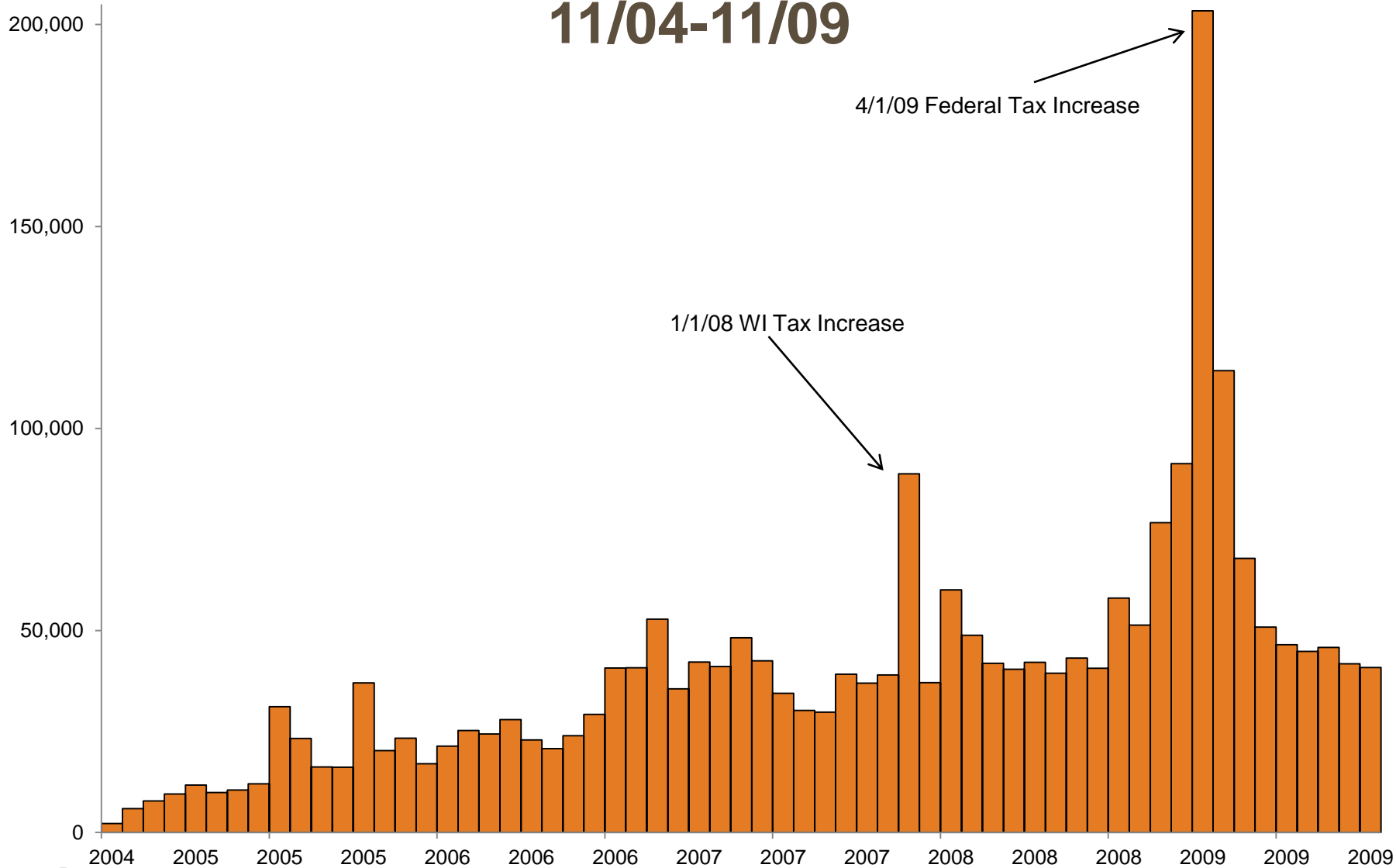


# Adult Prevalence & Price, Brazil

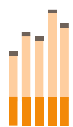
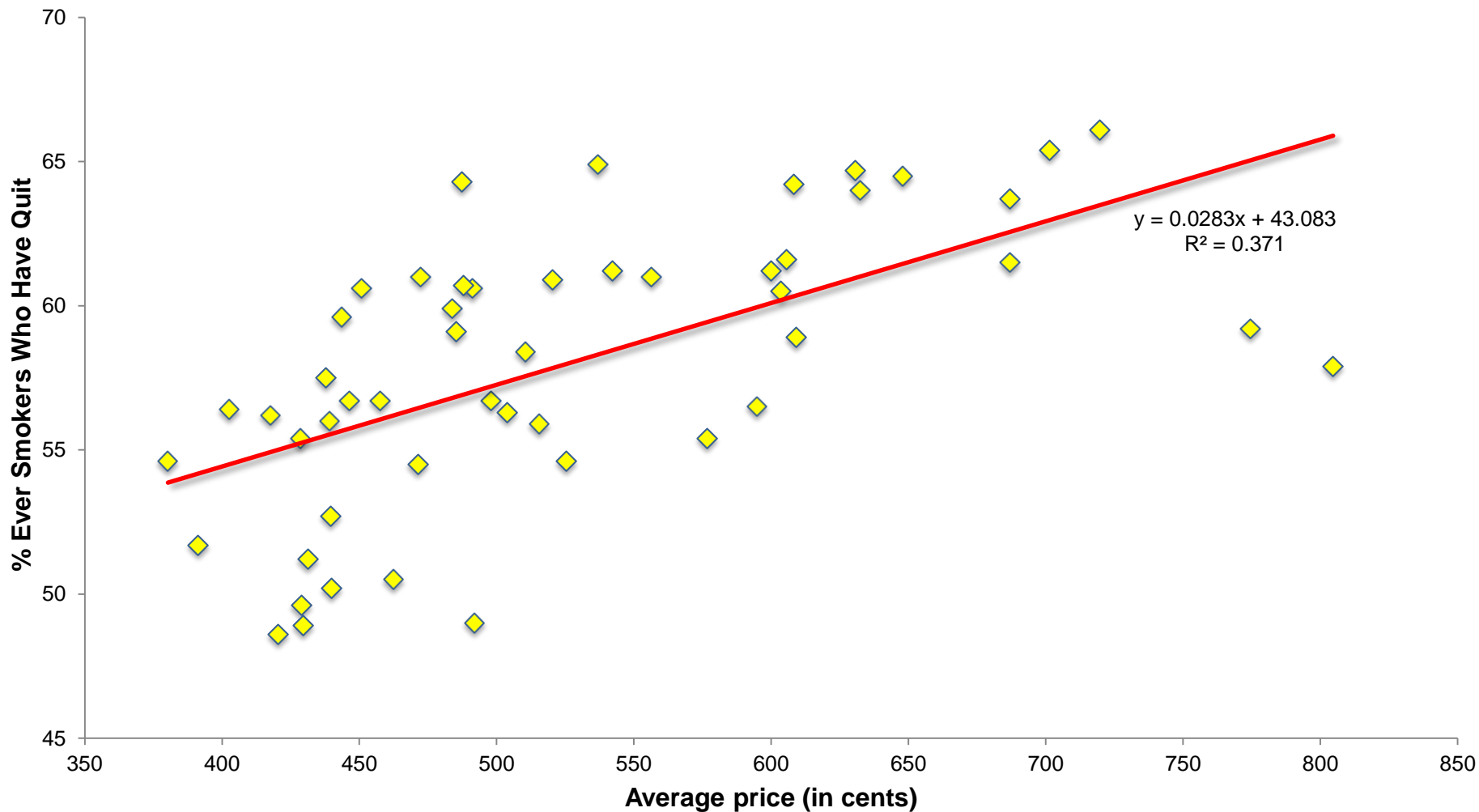
Adult Smoking Prevalence and Cigarette Price  
Brazil, Inflation Adjusted, 2006-2013



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

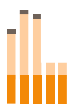
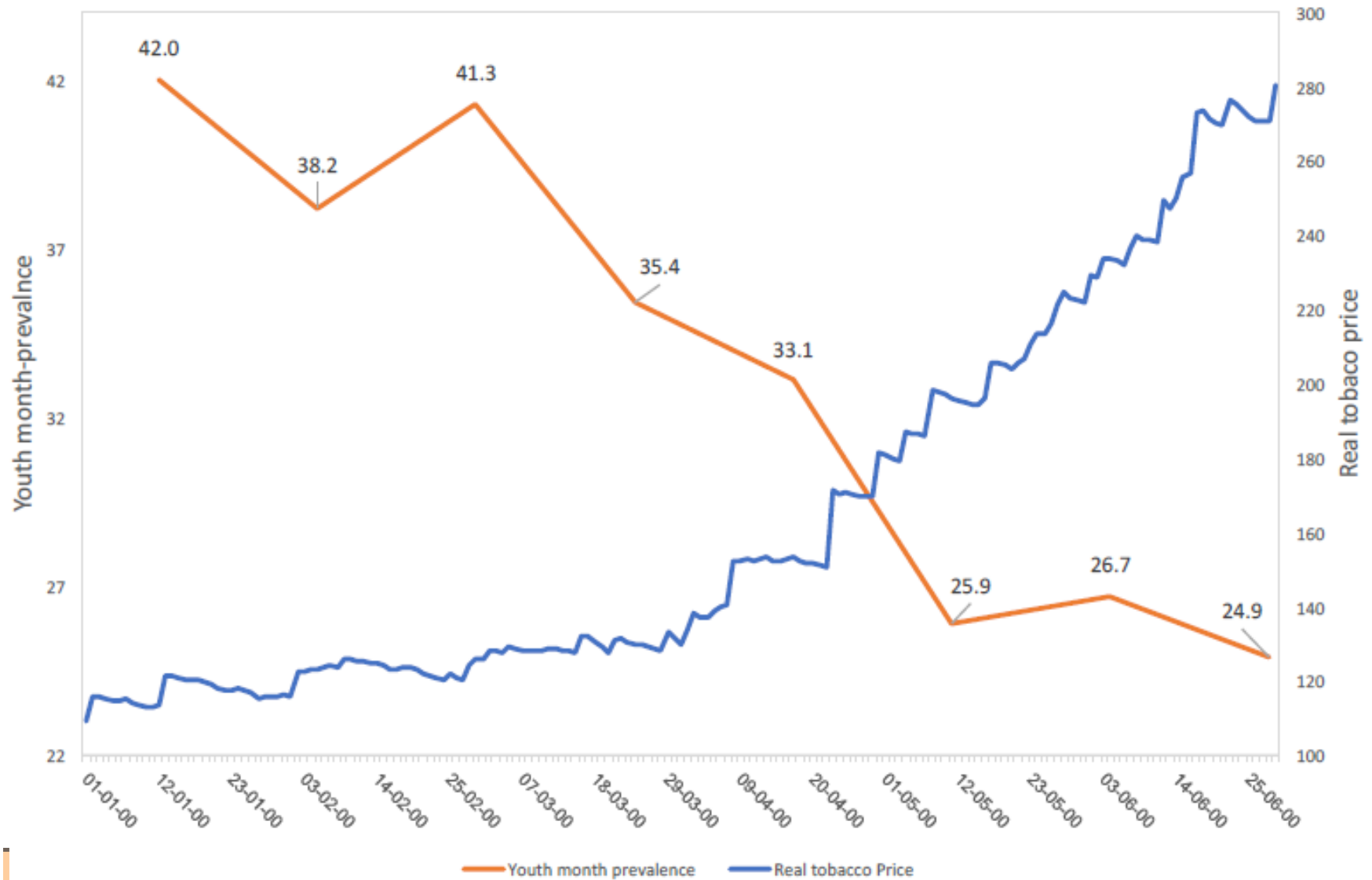


# Cigarette Prices and Cessation US States, 2009

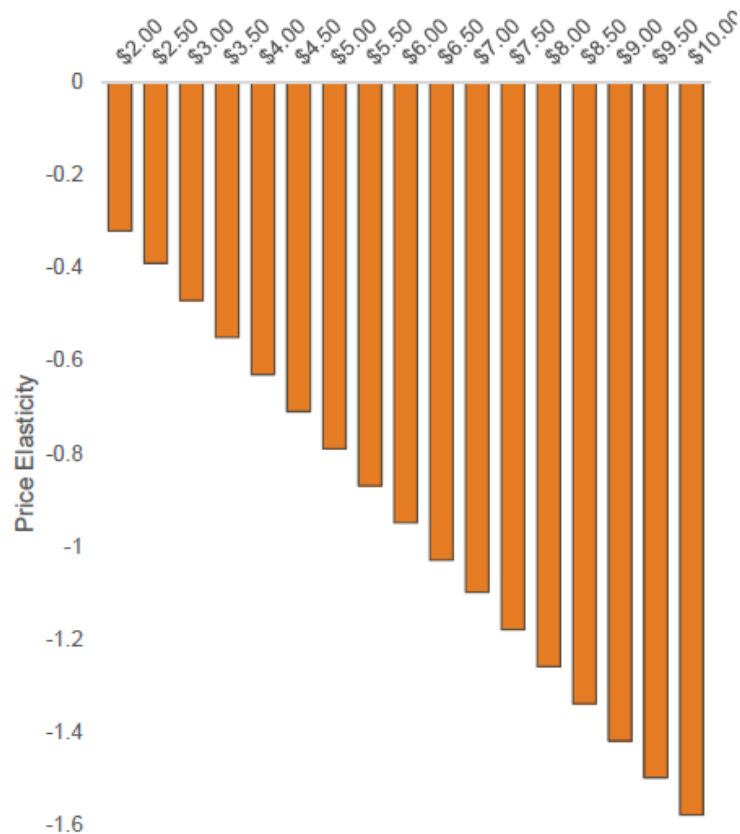


Source: BRFSS, *Tax Burden on Tobacco*, 2010, and author's calculations

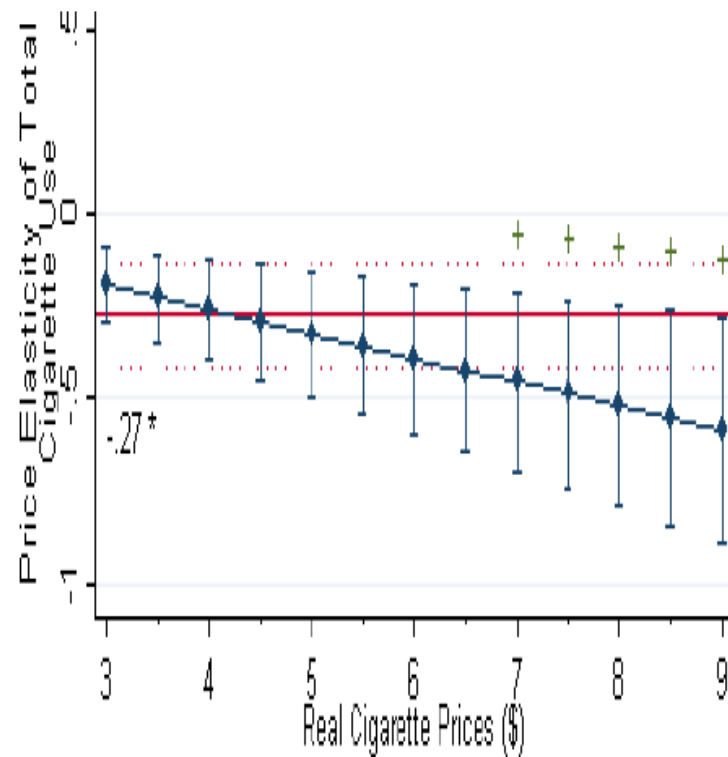
# Cigarette Price & Youth Smoking Prevalence Chile, 2000-2015



# Increasing Elasticity with Increasing Price



State tax-paid sales

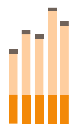
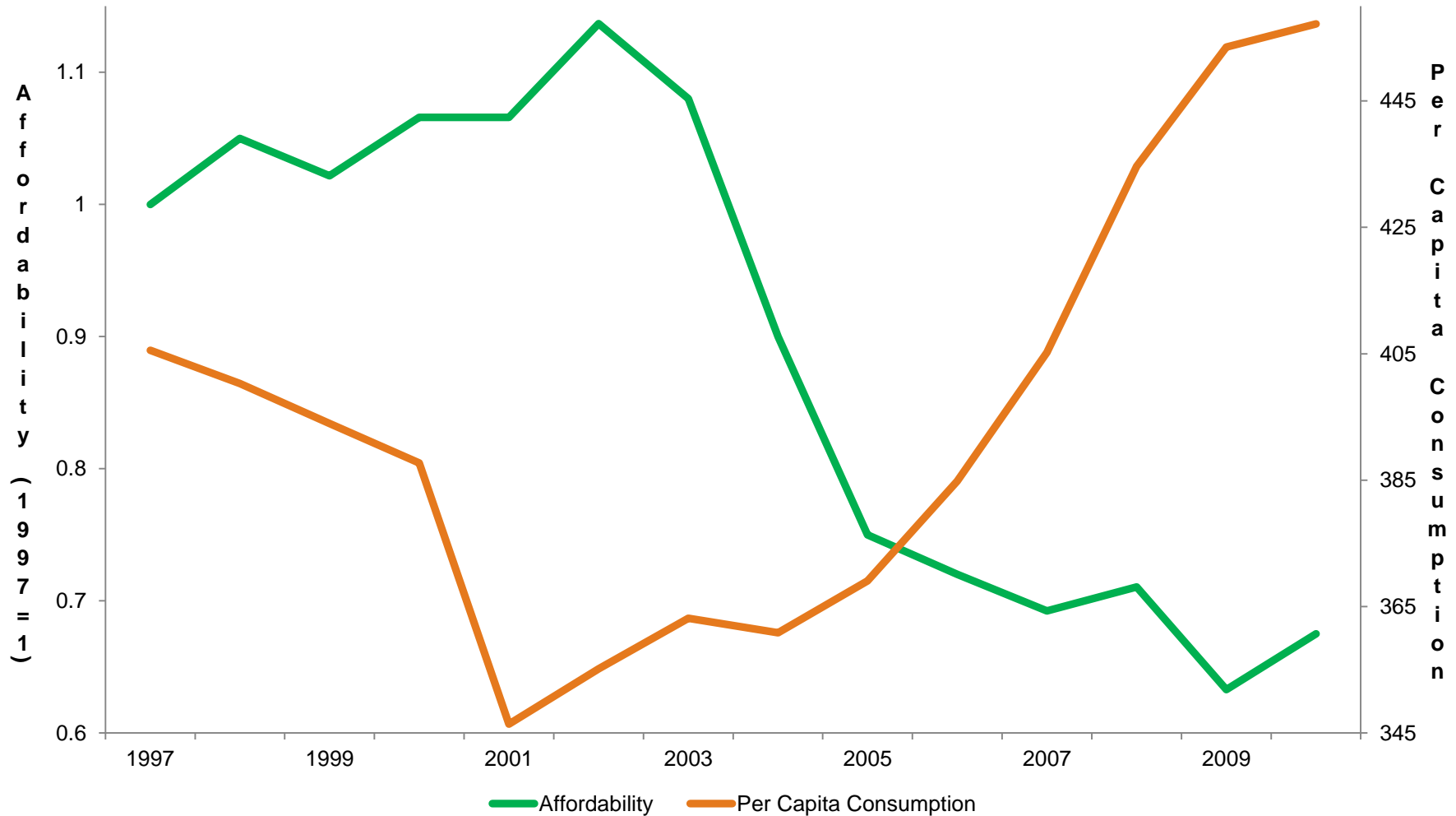


TUS-CPS Prevalence & Consumption

Sources: Tauras, et al., 2016; Pesko, et al., 2016

# Affordability and Tobacco Use

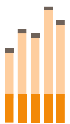
## Cigarette Sales, Bangladesh, 1997-2010



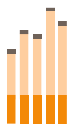
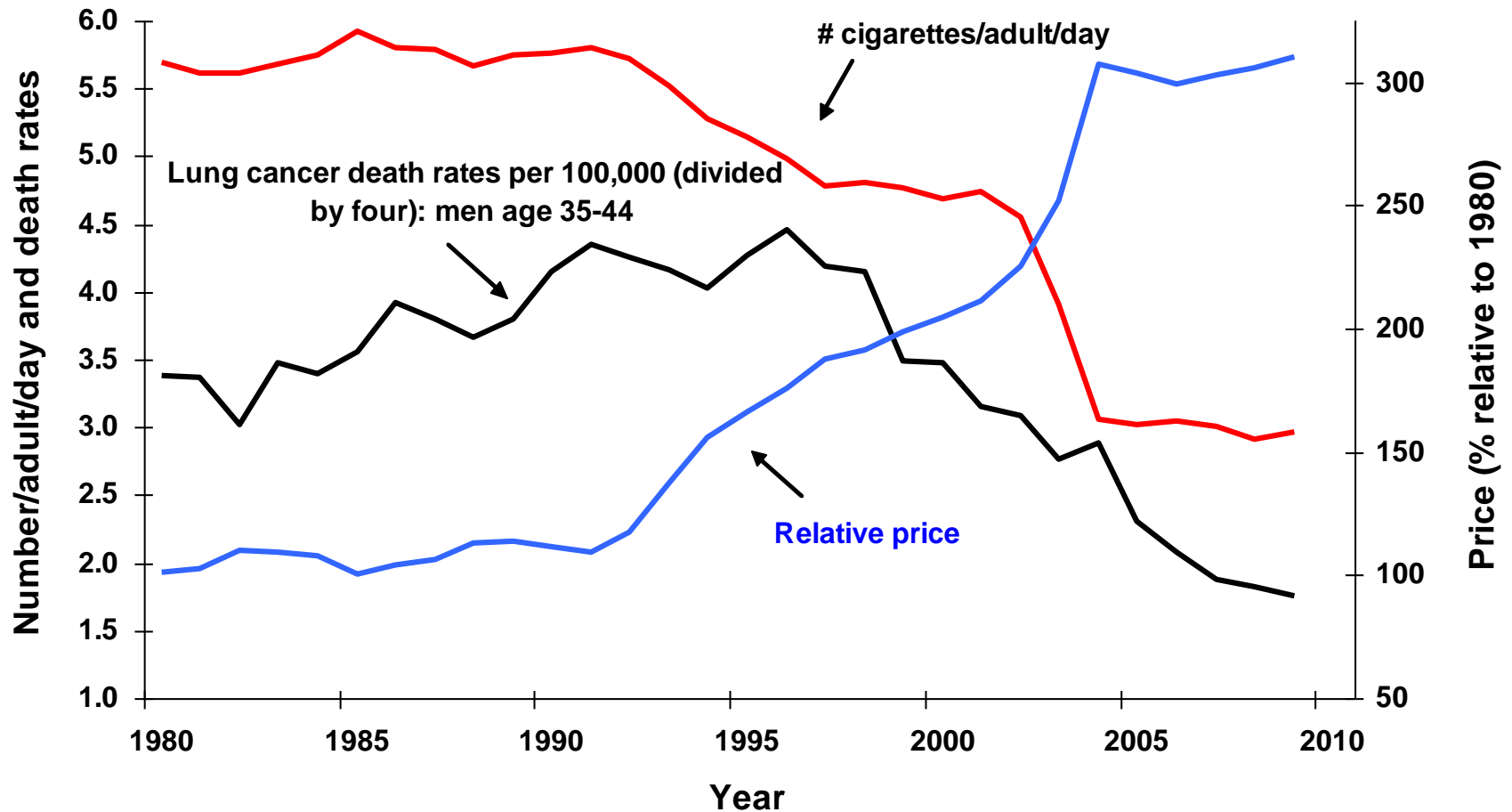


# Prices and Tobacco Use

- Similar evidence for variety of other tobacco products
  - Generally see evidence of substitution between similar products (e.g. cigarettes, little cigars, roll-your-own)
  - Some evidence of complementarity between combustibles and non-combustibles

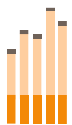
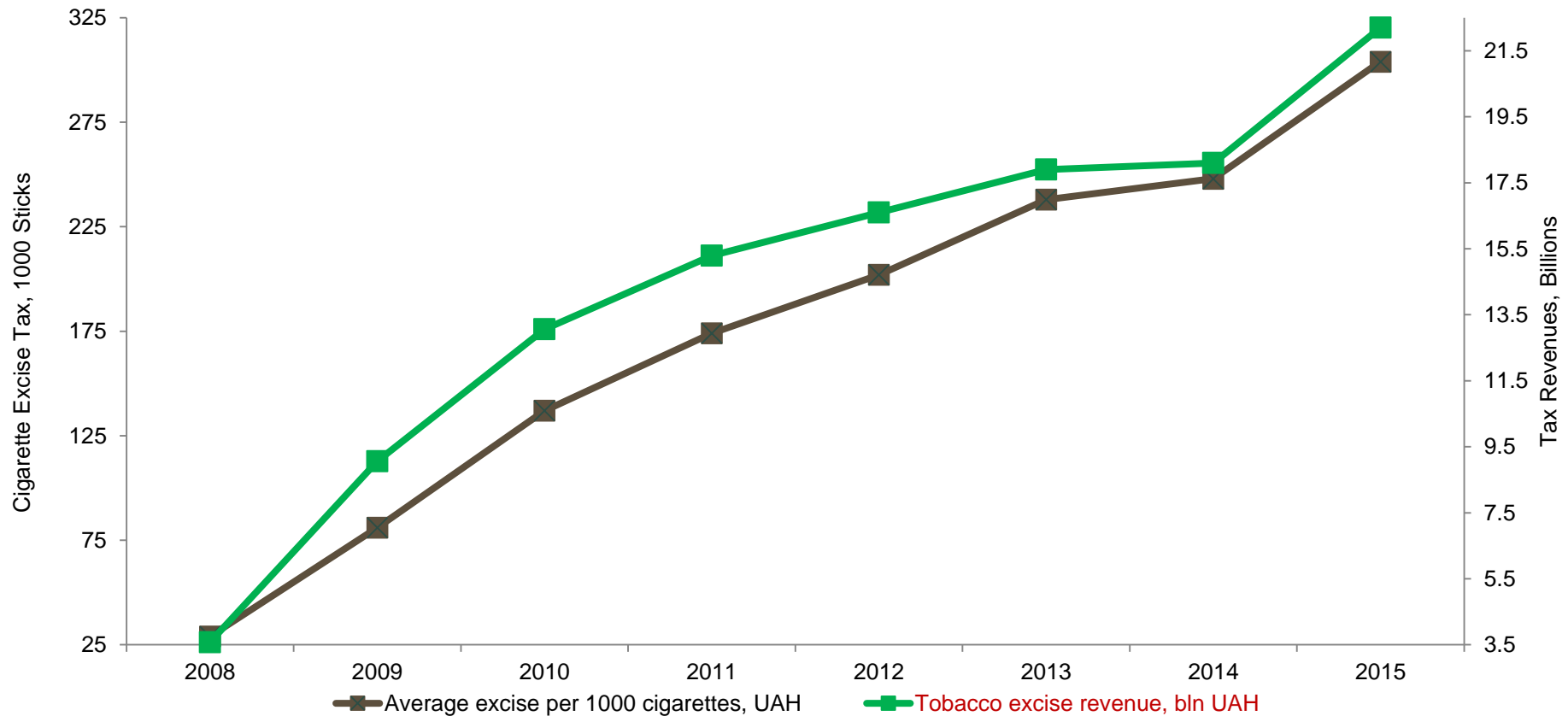


# France: smoking, tax and male lung cancer, 1980-2010

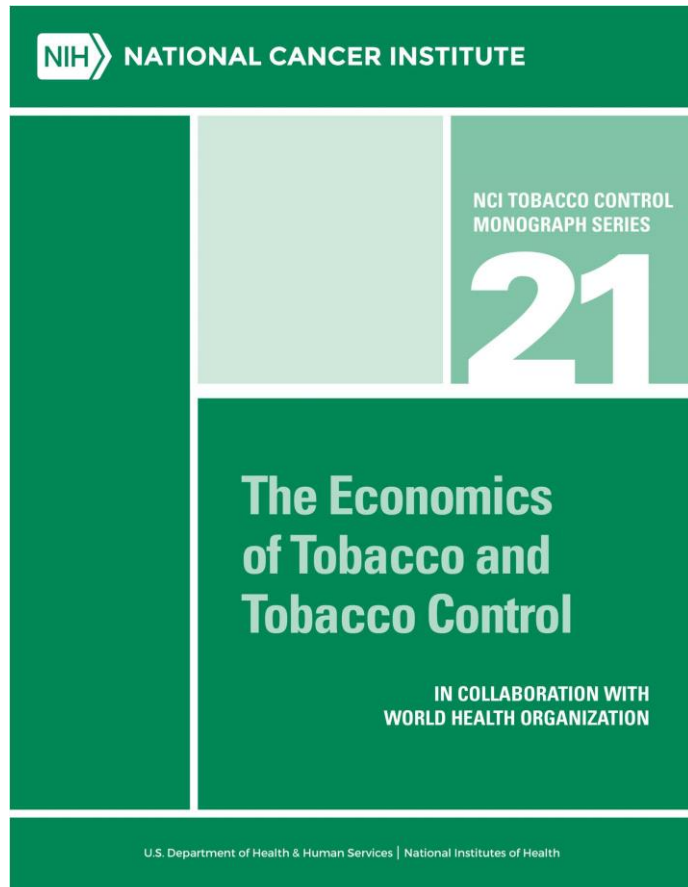


# Cigarette Tax and Tax Revenues Ukraine: 2008-2015

Average excise rate for cigarettes – increased 10-fold  
Cigarette Tax Revenue – increased 6-fold

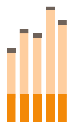


# Effectiveness of Tobacco Taxes



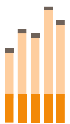
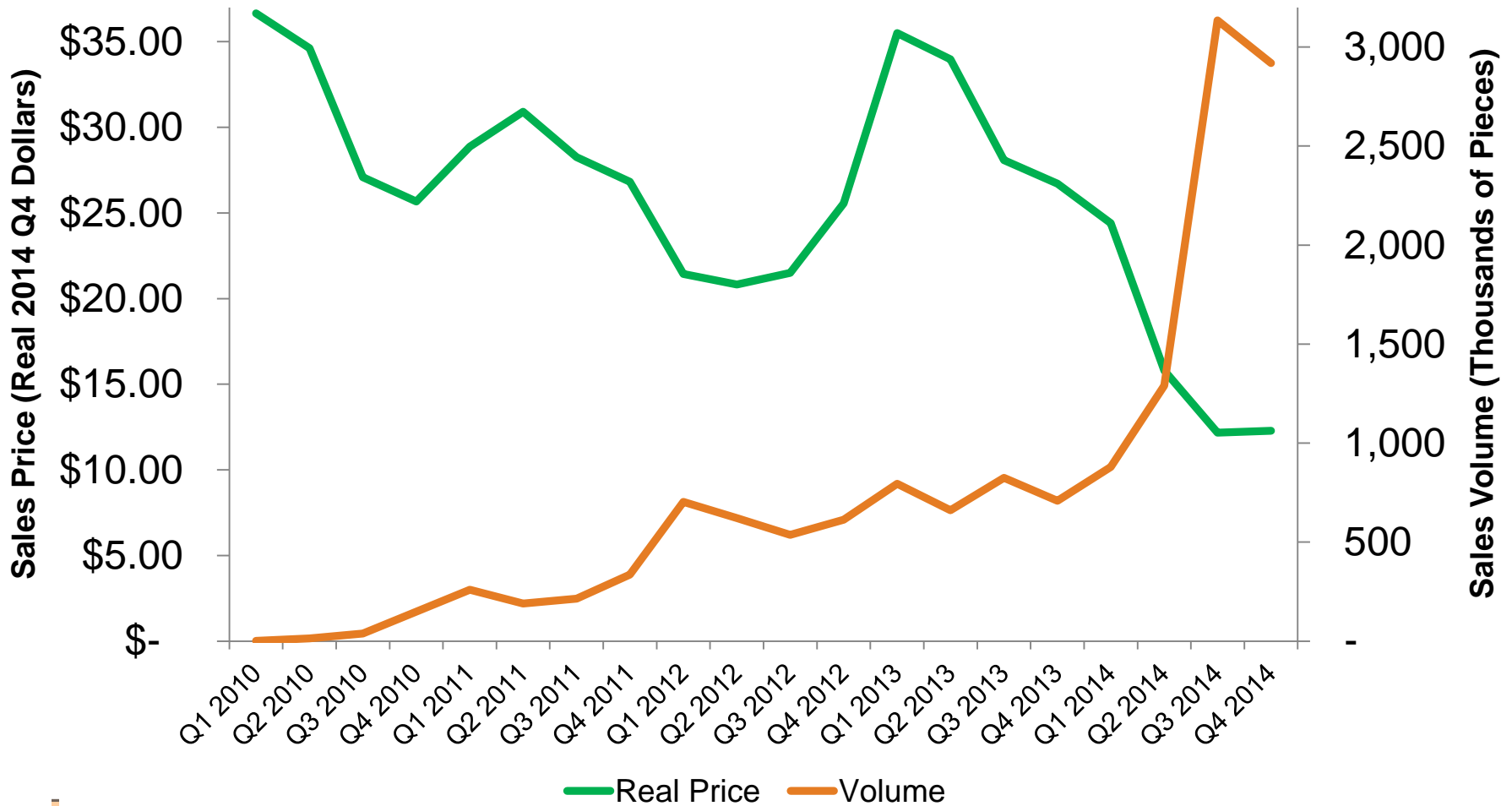
Chapter 4, Conclusion 1:

A substantial body of research, which has accumulated over many decades and from many countries, shows that **significantly increasing the excise tax and price of tobacco products is the single most consistently effective tool for reducing tobacco use.**



# Reusable E-Cigarettes

## Sale Volume and Price, US 2010 - 2014



# Harm Reduction

- Significant tax on vaping products coupled with increased taxes on cigarettes and other combustible tobacco products
  - Maintain or increase relative price of combustibles to deter initiation and promote cessation for all nicotine products
  - Maximize switching among those unable to quit while discouraging initiation and dual use
  - Generates significant new revenues
  - Relatively low cost, legal substitute could help address concerns about illicit trade



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PERSPECTIVE

**Differential Taxes for Differential Risks — Toward Reduced Harm from Nicotine-Yielding Products**

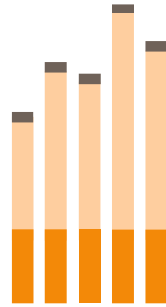
Frank J. Chaloupka, Ph.D., David Swenor, J.D., and Kenneth E. Warner, Ph.D.  
N Engl J Med 2015; 373:594-597 | August 13, 2015 | DOI: 10.1056/NEJMp1505710

**Circulation**  
JOURNAL OF THE AMERICAN HEART ASSOCIATION

 American Heart Association®

**Electronic Cigarettes: A Policy Statement From the American Heart Association**  
Aruni Bhatnagar, Laurie P. Whitsel, Kurt M. Ribisl, Chris Bullen, Frank Chaloupka, Mariann R. Piano, Rose Marie Robertson, Timothy McAuley, David Goff and Neal Benowitz  
on behalf of the American Heart Association Advocacy Coordinating Committee, Council on Cardiovascular and Stroke Nursing, Council on Clinical Cardiology, and Council on Quality of Care and Outcomes Research

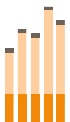
*Circulation*, published online August 24, 2014;  
*Circulation* is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231  
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Print ISSN: 0009-7322. Online ISSN: 1524-4539



# Taxes, Prices & Excessive Drinking

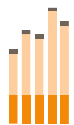
# Alcohol Taxes, Prices & Drinking

- Extensive econometric and other research shows that higher prices for alcoholic beverages significantly reduce drinking:
  - 10 percent price increase would reduce:
    - Overall consumption by 5.1% to 7.7% in HICs
    - Overall consumption by 6.4% in LMICs
  - Tax/price increases reduce all aspects of drinking
    - Prevalence, frequency, intensity
  - Generally larger effects on youth and young adults

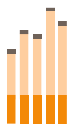
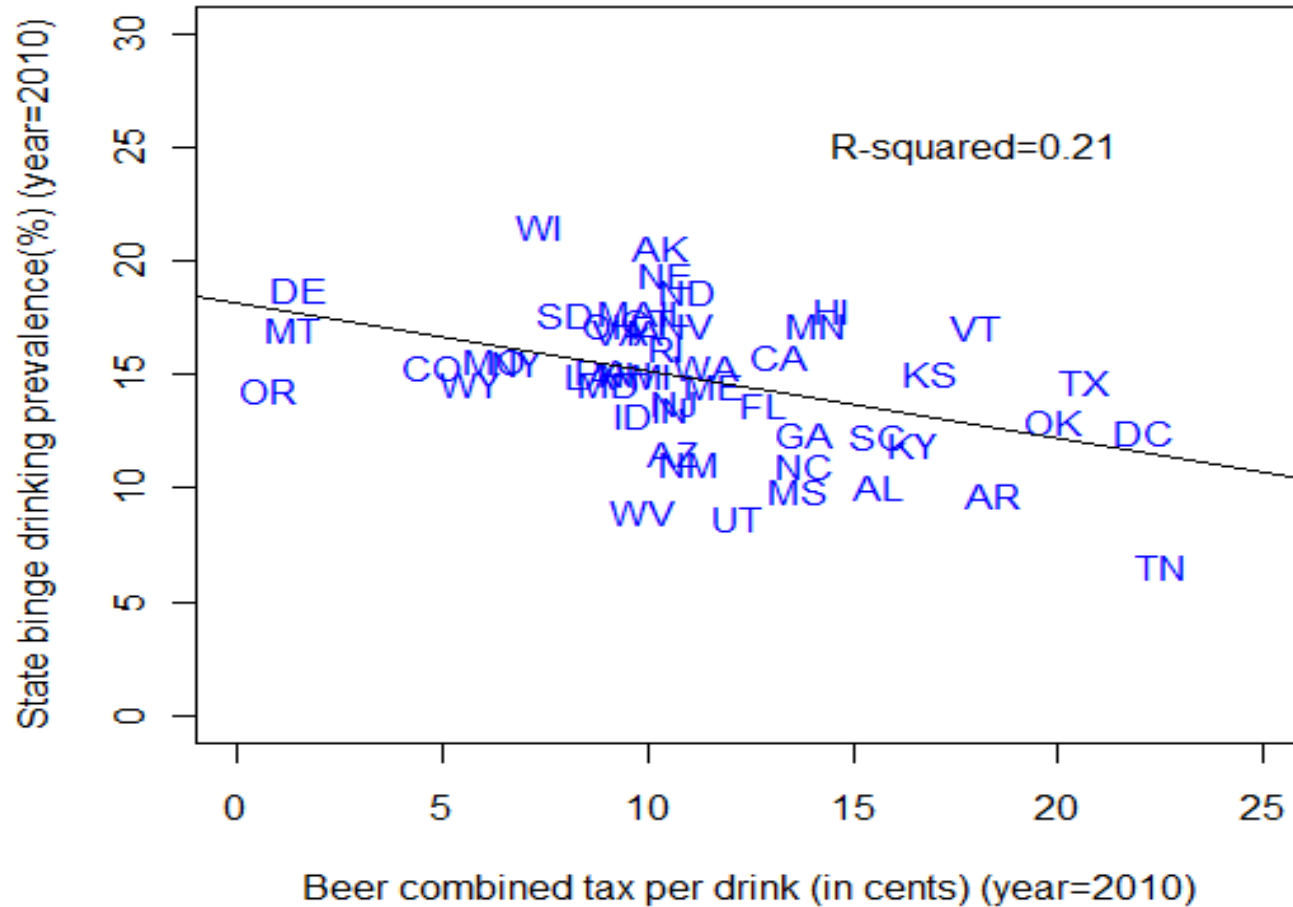




# Distilled Spirits Prices & Sales Ukraine, Inflation Adjusted, 2002-2016

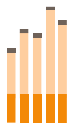


# Beer Tax and Binge Drinking Prevalence US States, 2010



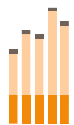
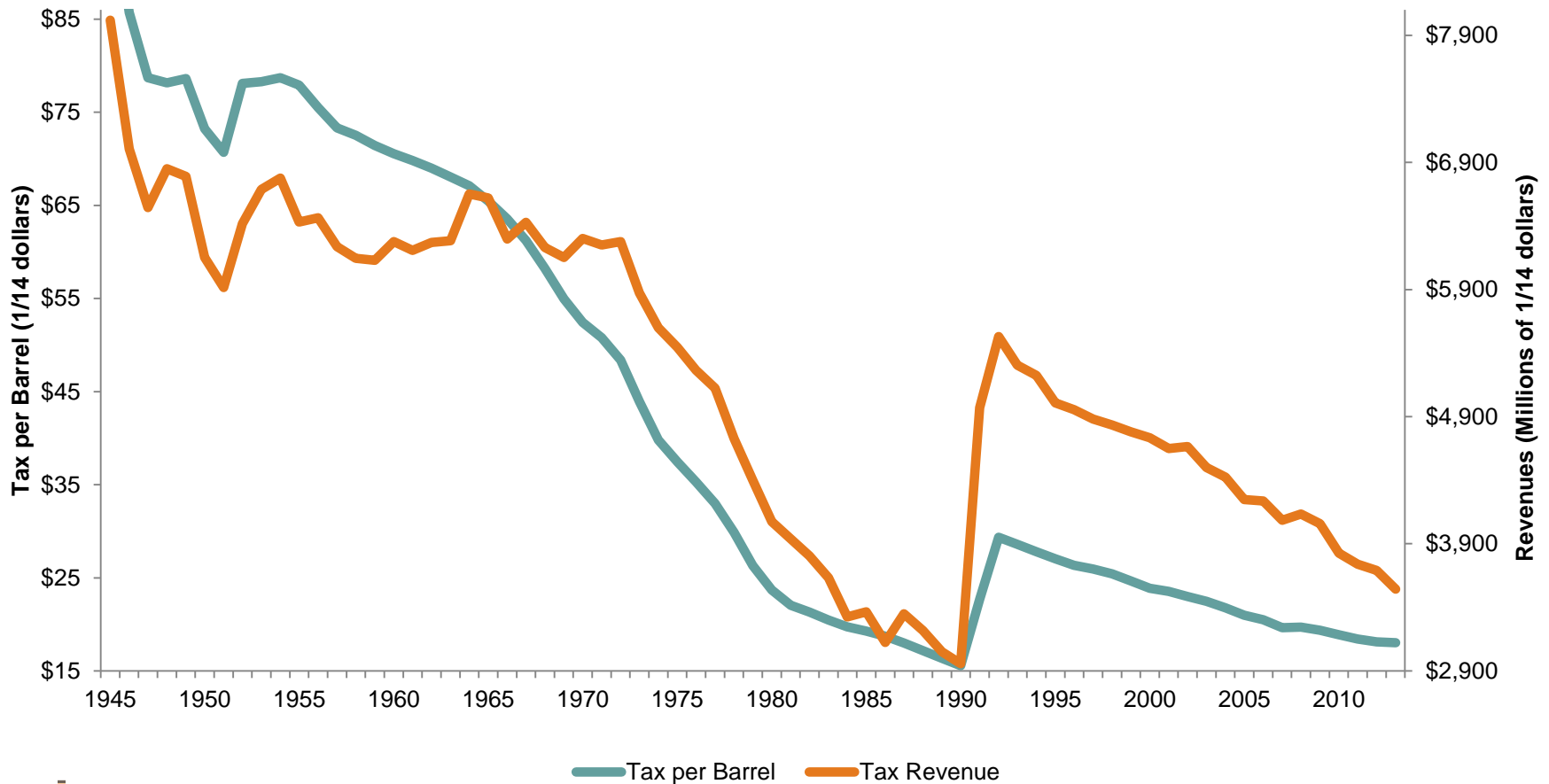
# Alcohol Taxes, Prices & Consequences

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

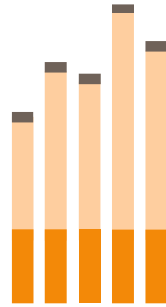


# Federal Beer Tax & Tax Revenues

## United States, Inflation Adjusted, 1945-2013



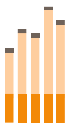
Source: *Brewers Almanac*, 2013, ATTTB, 2014, and author's calculations

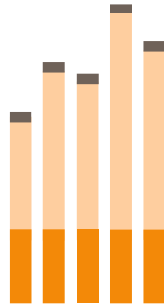


# Prices & Illicit Drug Use

# Illicit Drug Use

- Consistent evidence that increases in monetary prices reduce drug use
  - Cocaine: 10% price increase reduces use by about 3%
  - Heroin: 10% price increase reduces use by over 9%
  - Marijuana: 10% price increases reduces prevalence of youth marijuana use by 3%
- Generally find evidence of economic complementarity among illicit, licit substances



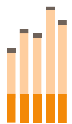


# **“Full Price” and the Demand for Addictive Products**

# Impact of Full Price

Extensive research on various aspects of “full price” and demand for various products

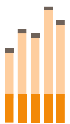
- Comprehensive smoke-free air policies, graphic health warnings on cigarette packs, mass media public education campaigns, and others reduce cigarette smoking among youth and adults
- Minimum legal purchase ages reduce youth drinking
- Strong laws against drunk driving reduce binge drinking, drinking and driving
- Limits on outlet density reduce drinking and consequences
- And much more.....





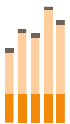
# Full Price and Illicit Drug Use

- Marijuana decriminalization
  - Generally find evidence that decriminalization of marijuana associated with increased use among adolescents and adults
- Other drug penalties
  - Mixed evidence on effects of statutory penalties for various illicit drug offenses and drug use
    - Likely due to differences in enforcement and adjudication



# Full Price and Illicit Drug Use

- Medical marijuana policies and youth marijuana use
  - Some evidence that perceived harms, disapproval are lower in states where marijuana has been approved for medical use
  - Some evidence that medical marijuana policies associated with increases in youth marijuana use
    - Particularly true for more liberal policies (e.g. those that allow home cultivation)
    - Appear to work through increases in perceived availability



# Denver: More Marijuana Shops Than Starbucks & McDonalds

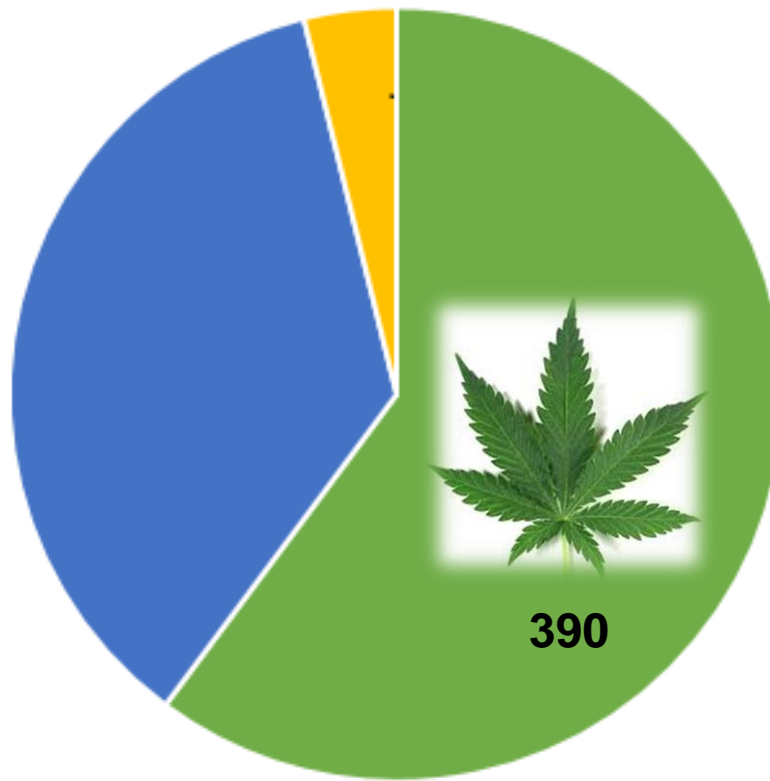
Marijuana 390 vs. Starbucks & McDonald's 233



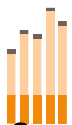
25



208



■ Marijuana Businesses ■ Starbucks ■ McDonald's





At Dixie we hope to test all of our delicious, refreshing, feel-good treats. Because we hope life feeling would just be sweeter.

Go ahead and try it! Our new single serving, Clear One low is perfect for novices or for those who don't like to share.

★ 5mg of THC in each bottle means you can sip, savor and see from a single dose of THC effects you.

Lightly carbonated and made with all natural Flavors and Watermelon Cream (from all kinds of seed just in case for someone).

*Ice cold cannabis.*

Learn more about One Single Dose and other Dixie edibles at [StateEdibles.com](http://StateEdibles.com)  
Enjoy responsibly. Never consume and drive.



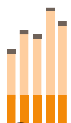
# 4/20 DEALS ALL DAY

Stop by & Say High

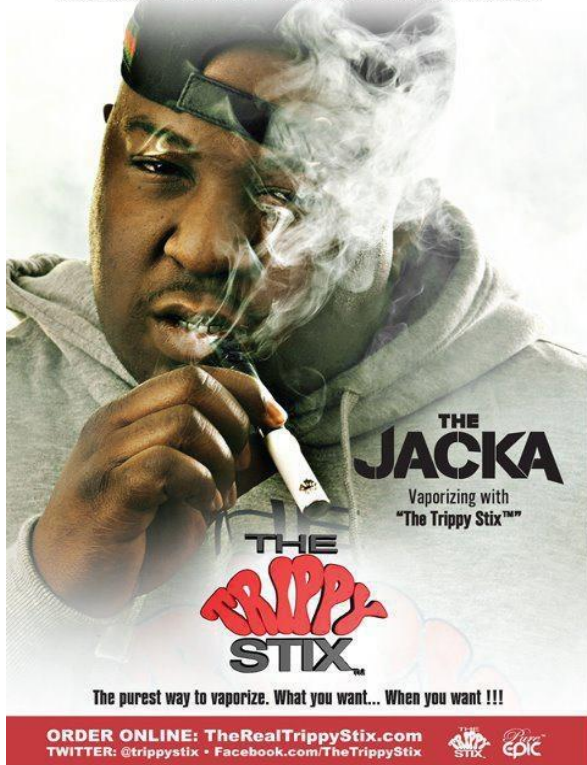
**FREE 1/8**  
BUY ONE 1/8 & GET AN 1/8 FREE  
**\$5 Grams & More**

**ALTITUDE**  
WELLNESS CENTER  
47 HAMPDEN & YOSEMITE

Click Now



THE WORLD'S FIRST NO CARTRIDGE VAPORIZER



“...offering cannabis consumers a **stealthy**, convenient way to get high in almost any location or situation.”

*High Times Magazine March 28, 2013*

“...it will produce almost scentless vapor and can be hit easily in a bathroom or on the street.”

*The Ipod of Getting Baked, Rolling Stone, June 20, 2013*

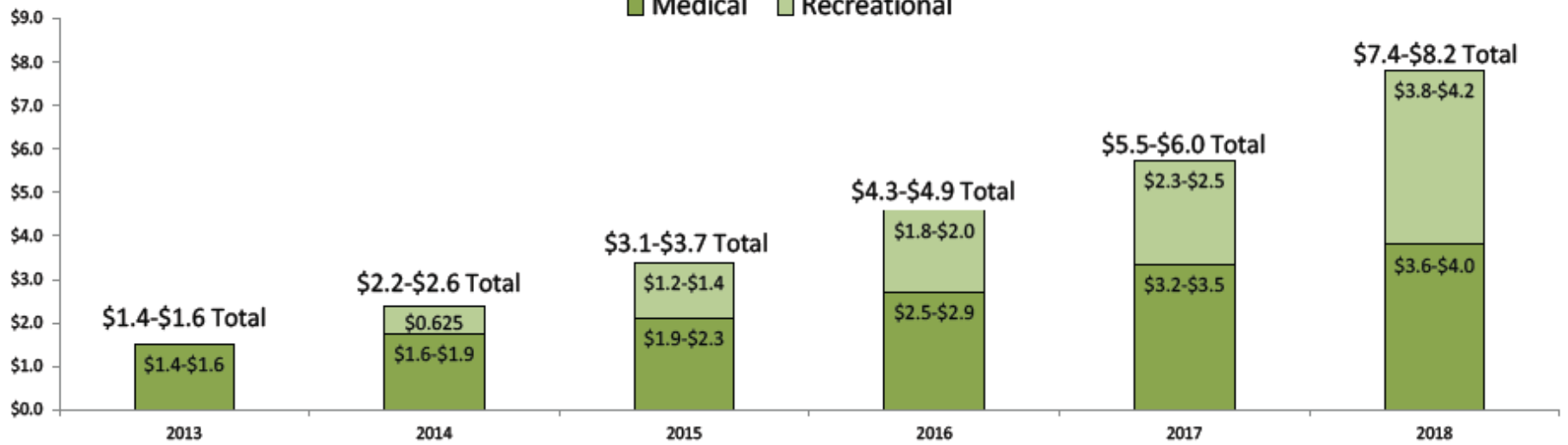


Source: Doyle, 2015

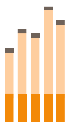
## U.S. Marijuana Sales Estimates 2013 - 2018

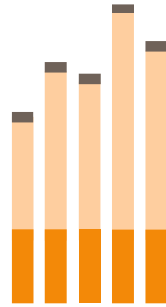
*in Billions of U.S. Dollars*

■ Medical ■ Recreational



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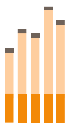
# Taxes, Prices & Diet, Weight



# 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%

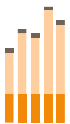


# Prices and Food & Beverage Consumption

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

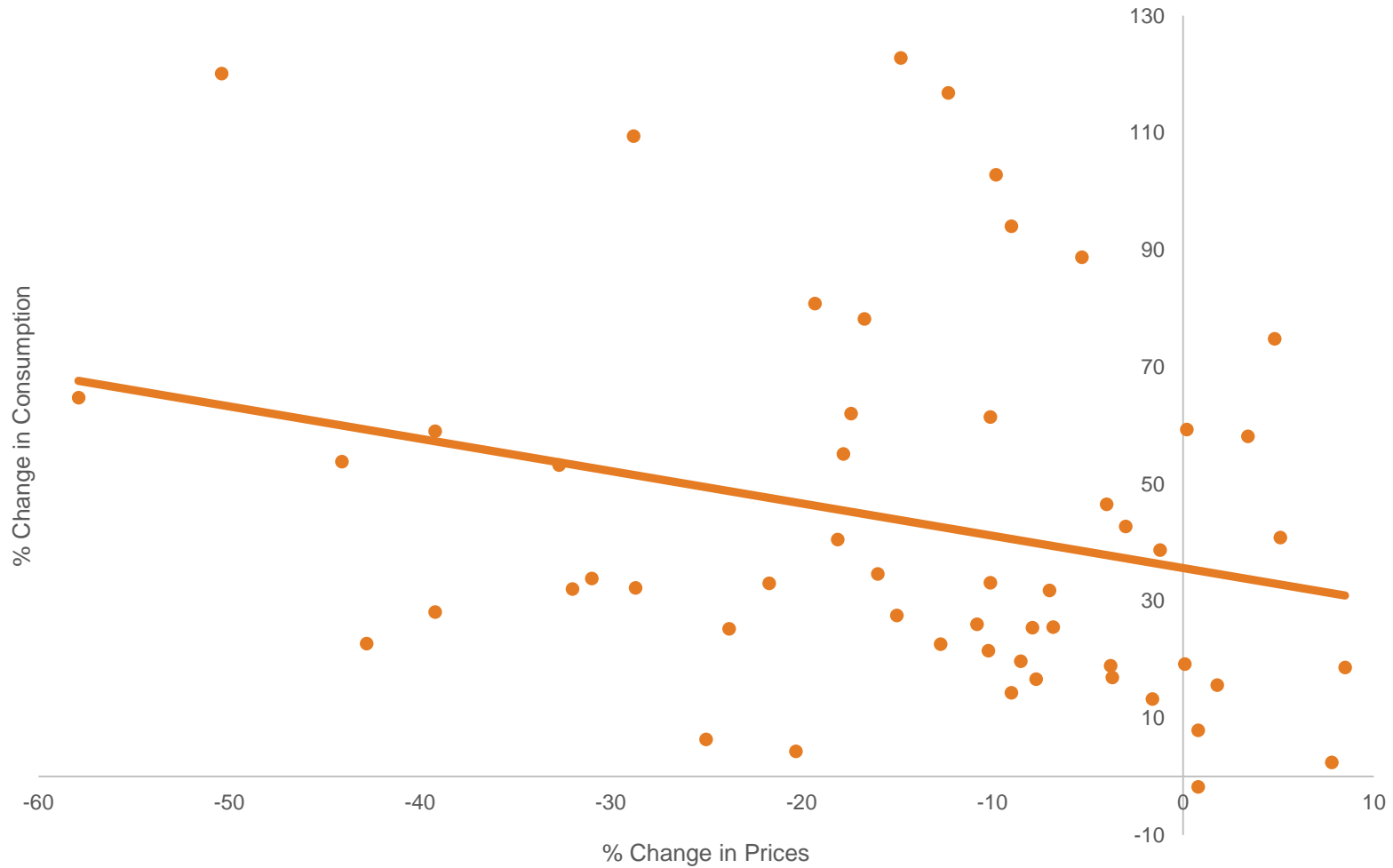
- Sugar-sweetened beverage consumption by 12.1%
- Fruit consumption by 4.9%
- Vegetable consumption by 4.8%
- Fast food consumption by 5.2%

Source: Powell, et al., 2013

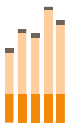


# Sweet & Savory Snack Prices & Consumption

## Percentage Change, 2000-2014, Selected Countries

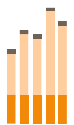
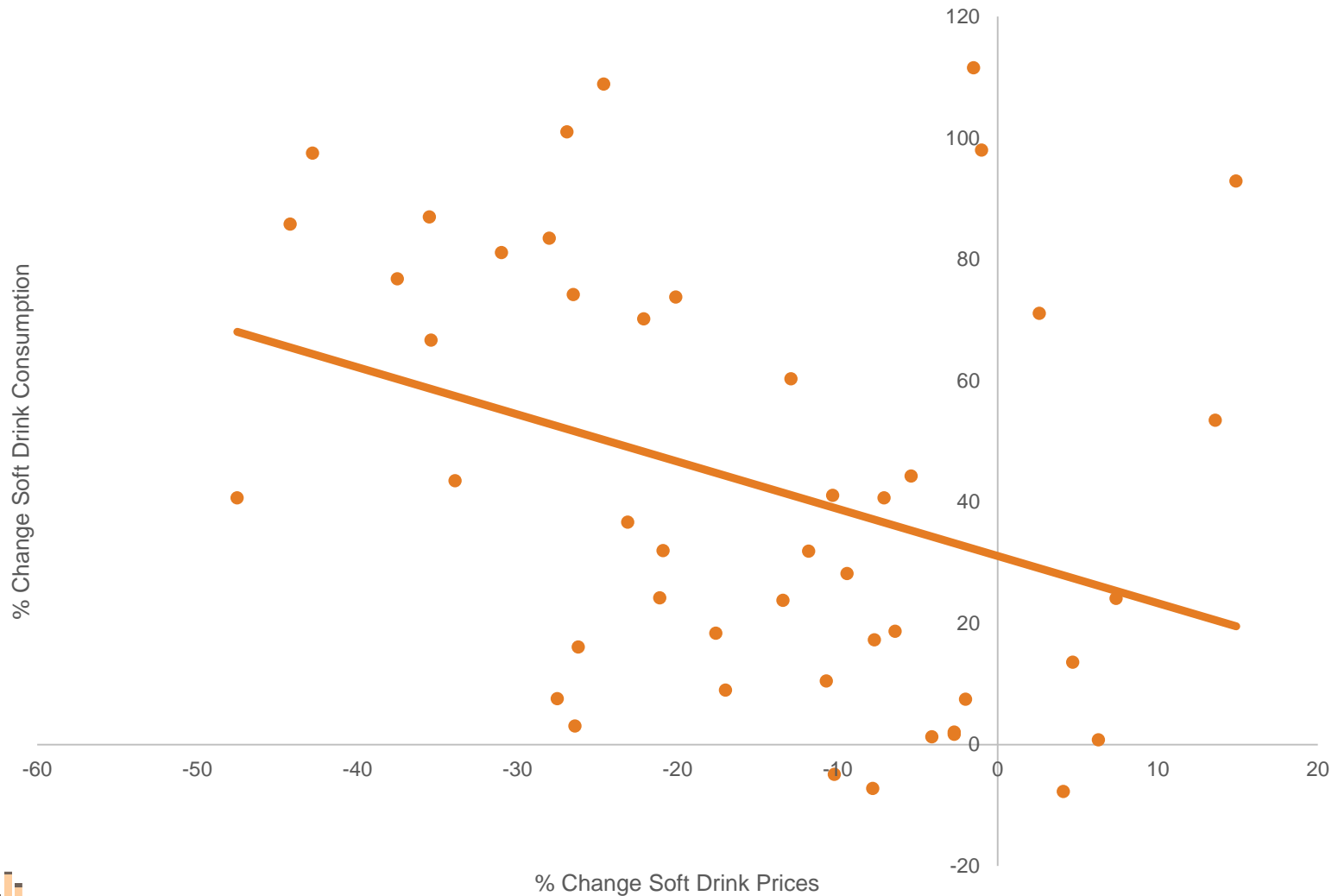


Source: Euromonitor, 2015, and author's calculations



# Soft Drink Prices & Consumption

## Percentage Change, 2000-2014, Selected Countries



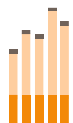
Source: Euromonitor, 2015, and author's calculations

# Prices and Weight Outcomes

While mixed, 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

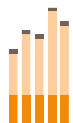
Source: Powell, et al., 2013

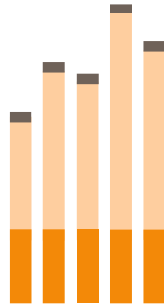


# Prices and Weight Outcomes

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

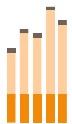
# Rationale for SSB Taxes

- 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

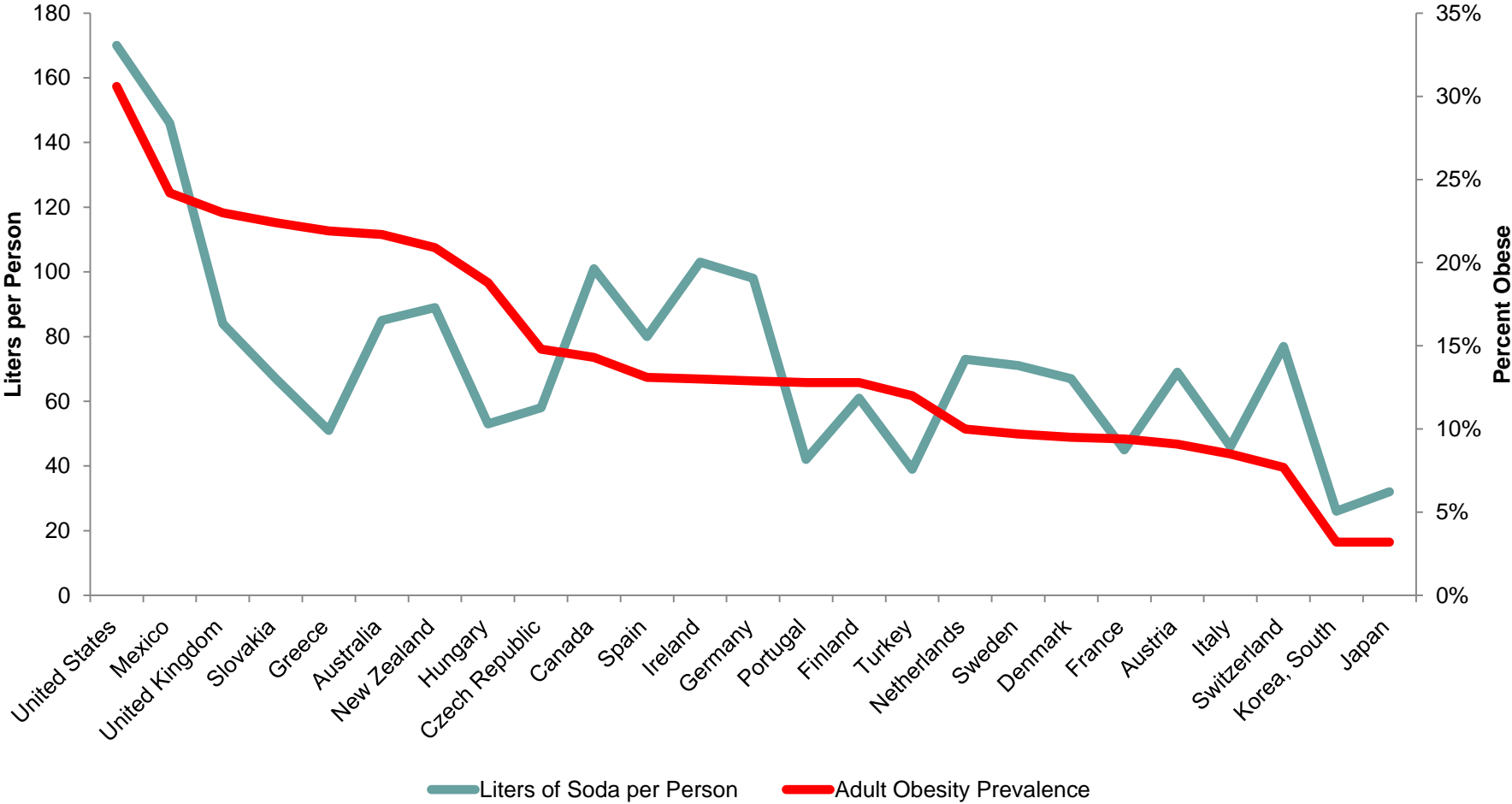
- Other health consequences

- Type 2 diabetes, lower bone density, dental problems, headaches, anxiety and sleep disorders
- Sugar Addiction?





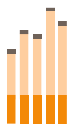
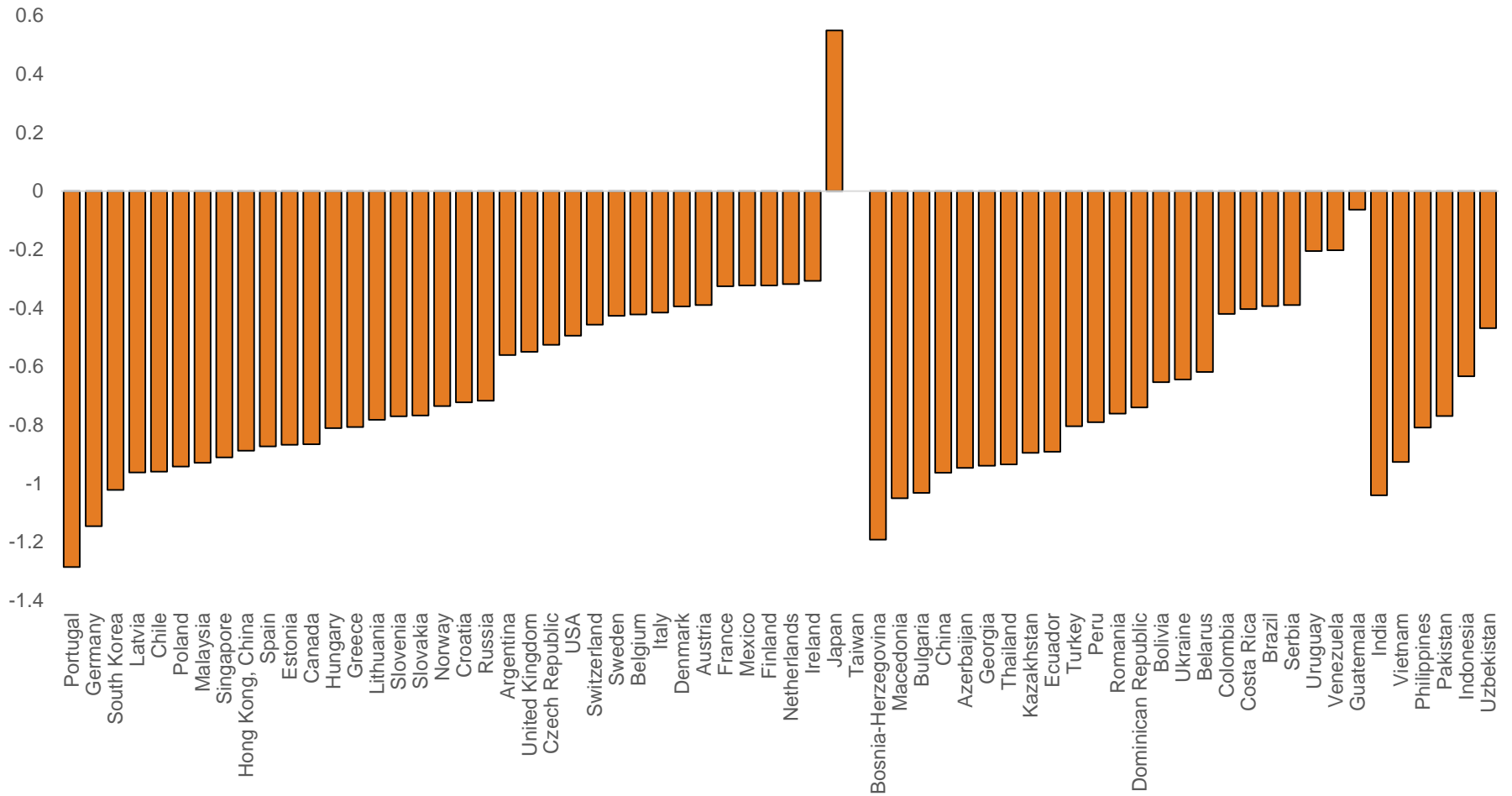
# Soda Consumption & Obesity Selected Countries



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



# Change in Soft Drink Affordability 2000-2013, Selected Countries



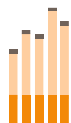
Source: Euromonitor, 2015, and author's calculations

# 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

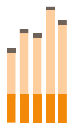
Source: Powell, et al., 2013



# Soda Taxes in Mexico

Evidence from Mexico's peso per liter SSB tax;

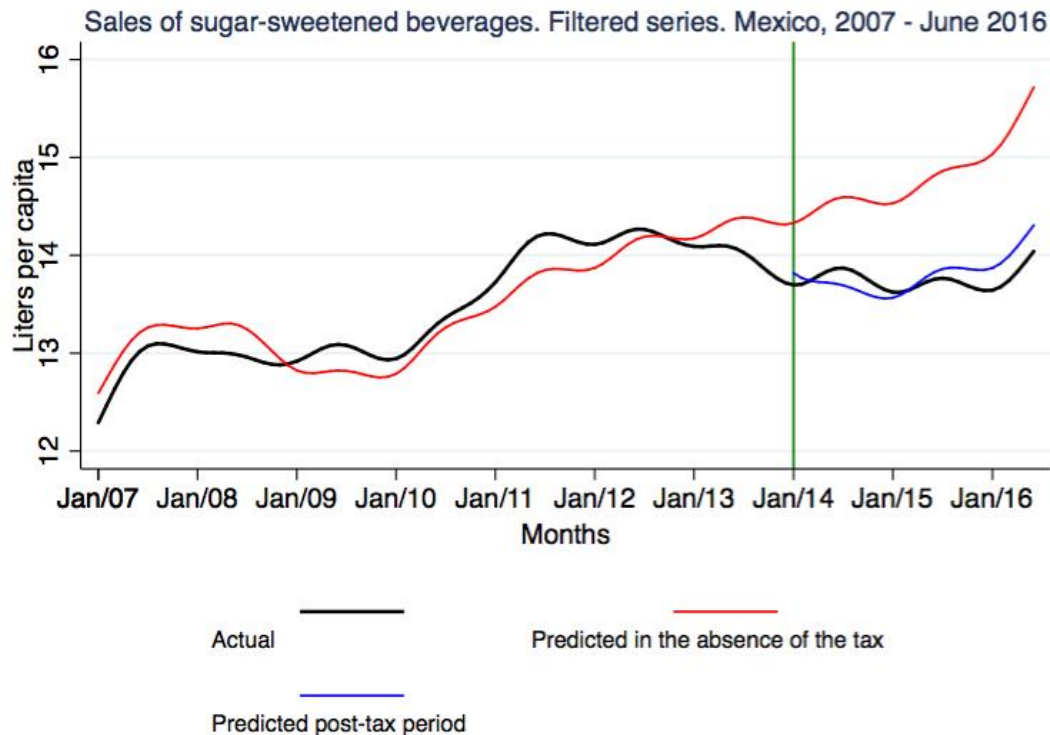
- Increased prices for SSBs relative to non-taxed beverages
  - about 10% price increase
  - pass through varies by type, size, location
- Significant reduction in SSB sales, consumption
  - growing over time
- Significant increase in bottled water consumption
- Greater impact on heavier consumers, low-income 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

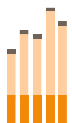


Impact on SSB sales consistent with reductions in purchases:

- **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

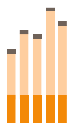
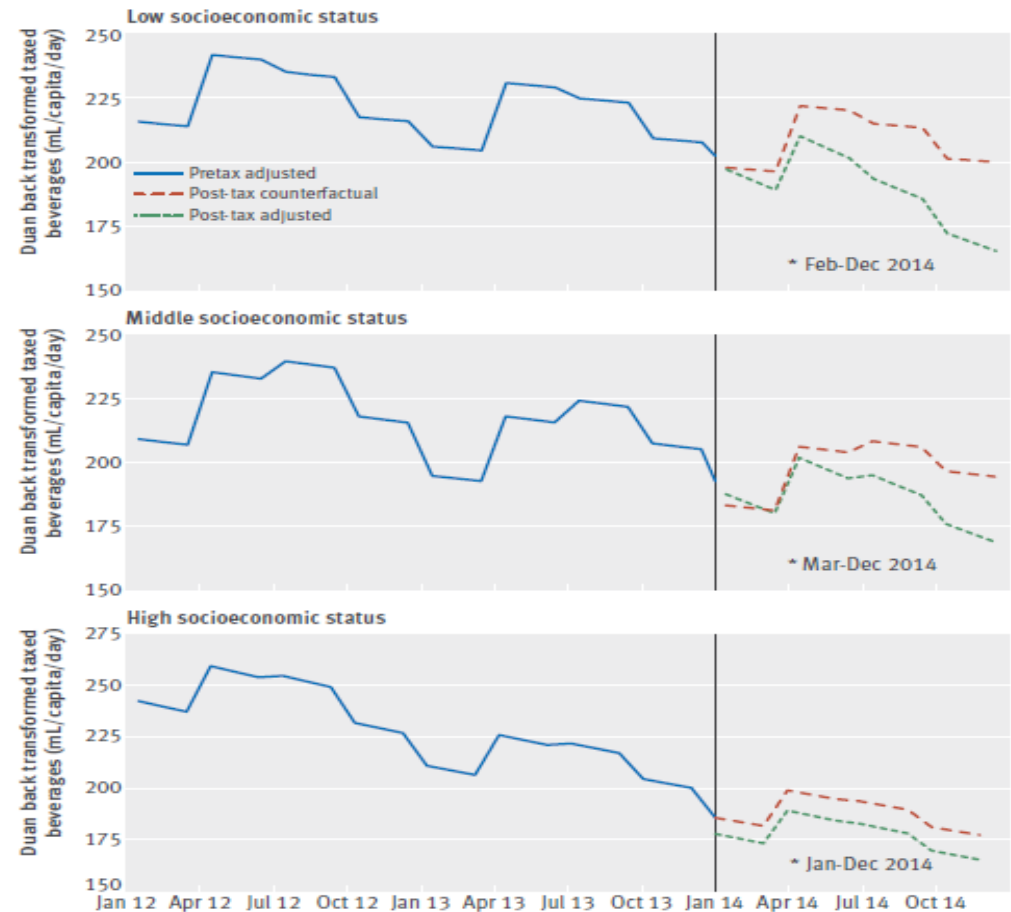


Colchero MA, Guerrero Lopez C, Molina M, Rivera J . Beverage sales in Mexico before and after implementation of a sugar sweetened beverages tax. 2016. PLoS ONE. 11(9).

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>

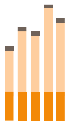
# Impact of Tax on Purchases Year One (2014)

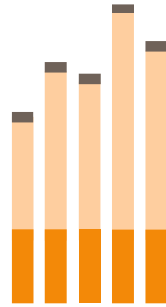
- Purchases of taxed beverages reduced in all SES groups
- Reductions in purchases **greatest among lowest SES households**
  - **9% decline in 2014**



# Impact of Tax on Purchases Year One (2014)

- Greatest impact on heaviest consumers
  - Highest purchasers:
    - 31% of households, purchased average of 157 liters of SSB/capita/yr
      - *10% reduction in purchases following tax*
  - Middle purchasers:
    - 40% of households, purchased average of 60 liters of SSB/capita/yr
      - *8% reduction of taxed beverages post-tax*
  - Light and non purchasers:
    - Remaining households; small impact on light purchasers





# Oppositional Arguments

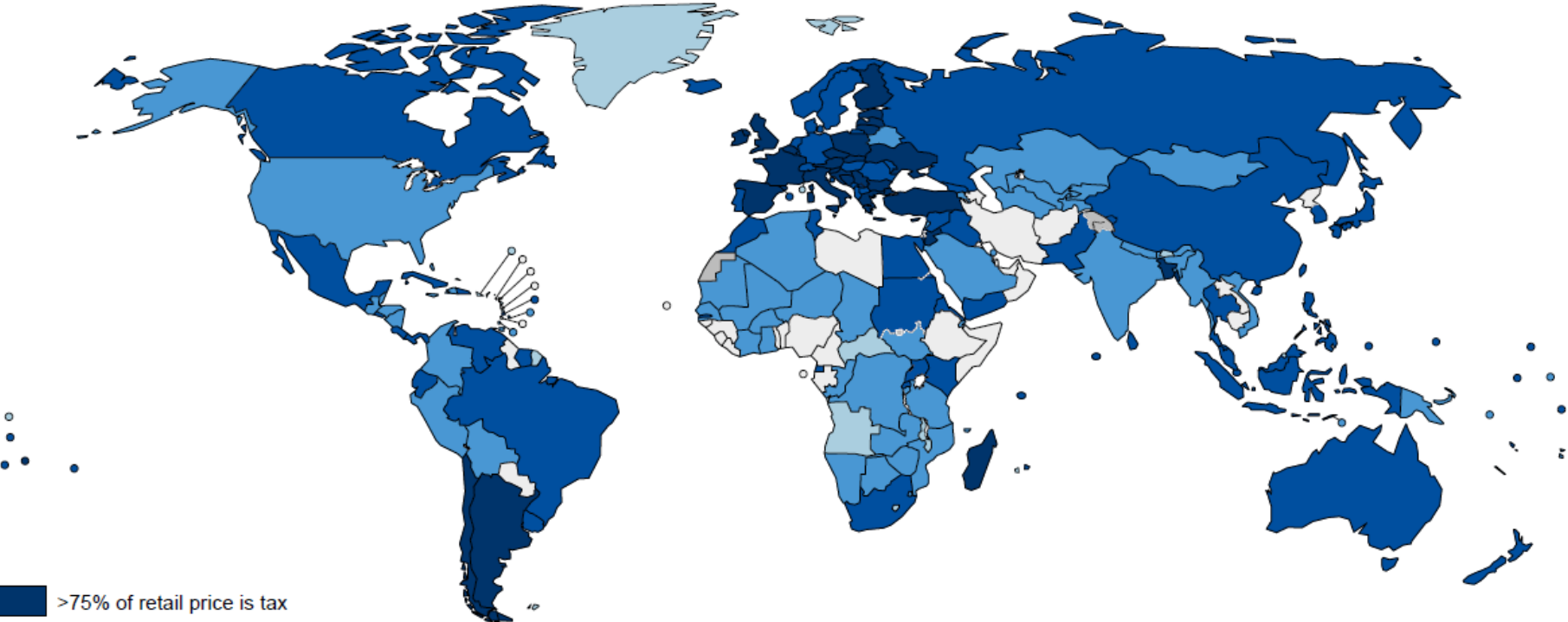
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## Myths & Facts

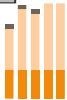


# Cigarette Taxes as Percent of Retail Price

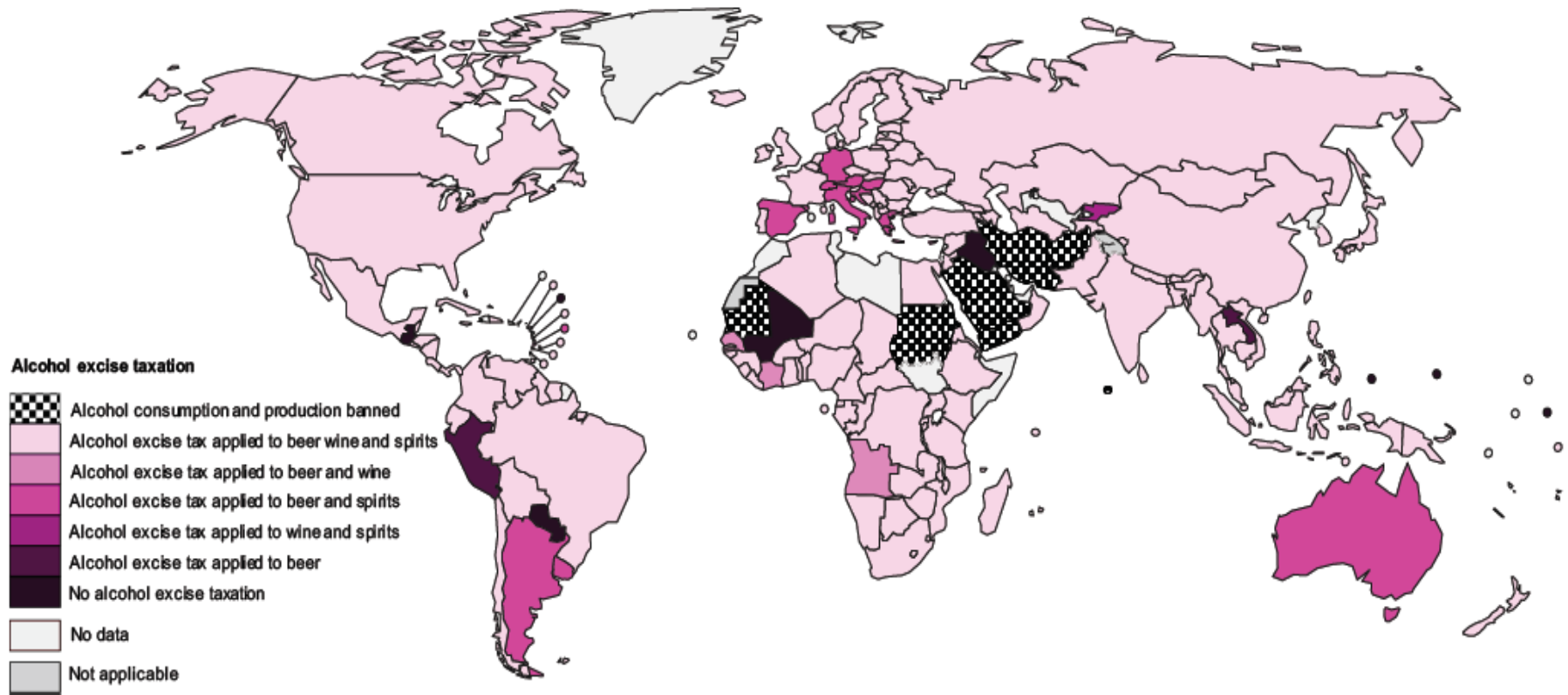
## July 2016



- >75% of retail price is tax
- 51–75% of retail price is tax
- 26–50% of retail price is tax
- ≥25% of retail price is tax
- Not classified or data not available
- Not applicable



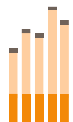
# Alcoholic Beverage Excise Taxes by Beverage Type



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country territory city or area or of its authorities or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.



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# Sugary Drink Taxes, January 2018

1. COOK ISLANDS
2. KIRIBATI
3. FRENCH POLYNESIA
4. MEXICO
5. CHILE
6. DOMINICA
7. BARBADOS
8. PORTUGAL
9. SPAIN (CATELONIA)
10. IRELAND
11. UNITED KINGDOM
12. FRANCE
13. BELGIUM
14. NORWAY
15. FINLAND
16. ESTONIA
17. HUNGARY
18. ST HELENA
19. SOUTH AFRICA
20. SAUDIA ARABIA
21. UNITED ARAB EMIRATES
22. MAURITIUS
23. SEYCHELLES
24. BRUNEI
25. NAURU
26. FIJI
27. SAMOA
28. TONGA

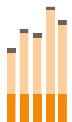


28 COUNTRIES &

7 US CITIES (so far...)\*

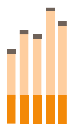


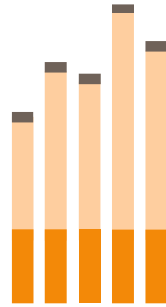
1. SAN FRANCISCO, CA
2. BERKELEY, CA
3. ALBANY, CA
4. OAKLAND, CA
5. SEATTLE, WA
6. BOULDER, CO
7. PHILADELPHIA, PA



# Common Oppositional Arguments

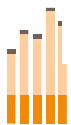
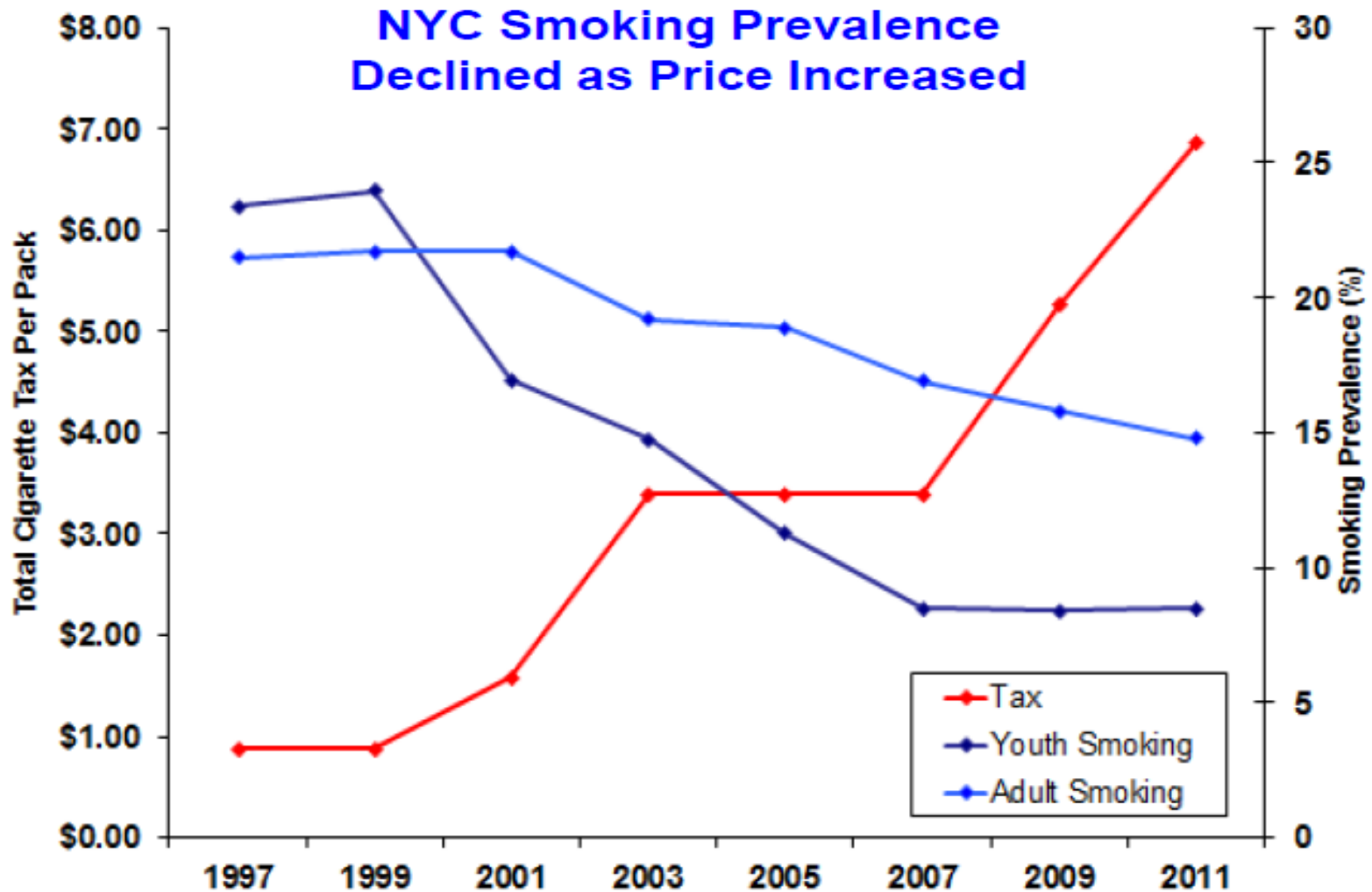
- Industries and allies use several common arguments in opposition to tax increases:
  - Won't have the intended impact in terms of reducing use and consequences
  - Will lead to extensive tax avoidance and tax evasion
  - Will harm poor and working class consumers
  - Will lead to massive job losses





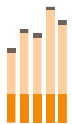
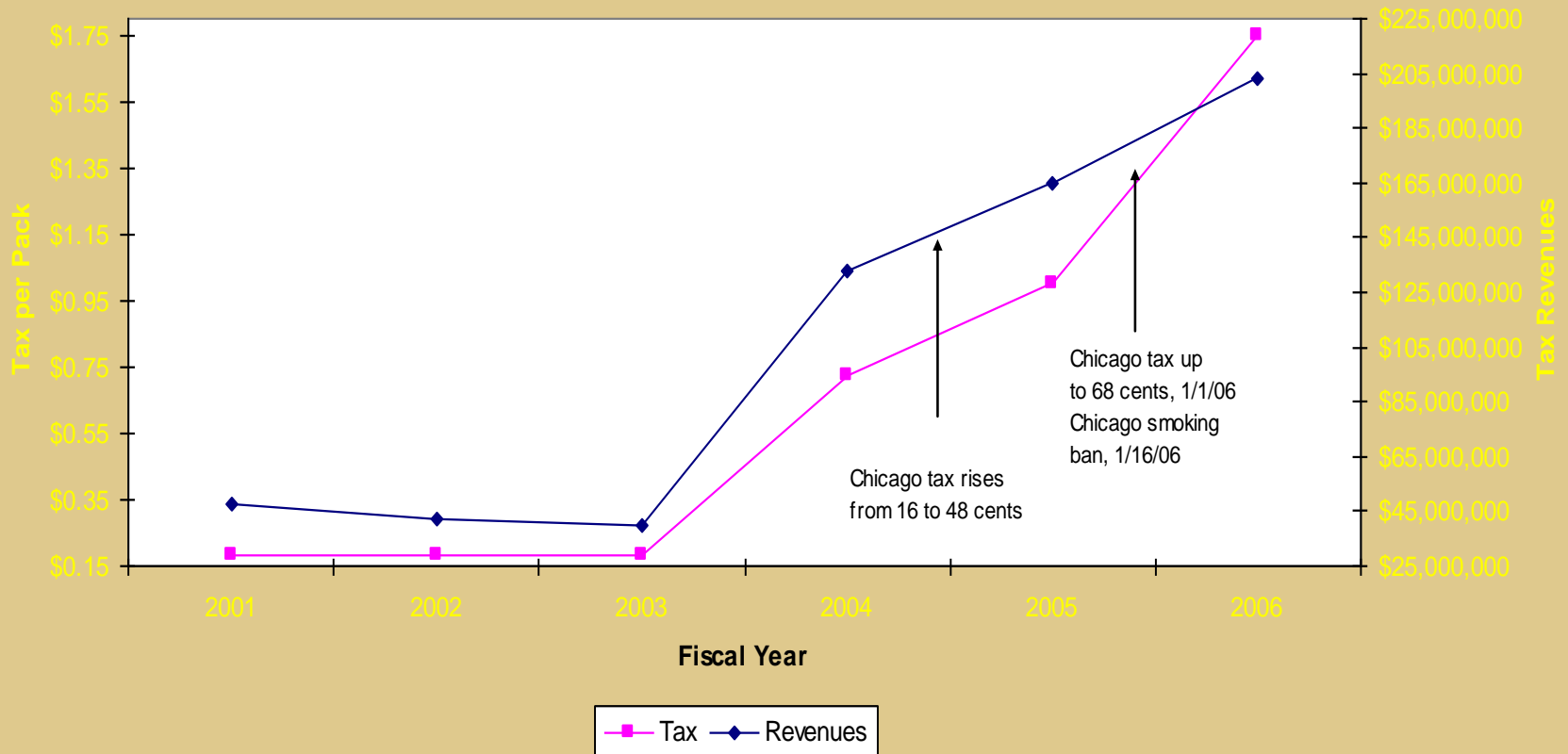
# Tax Avoidance & Evasion

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

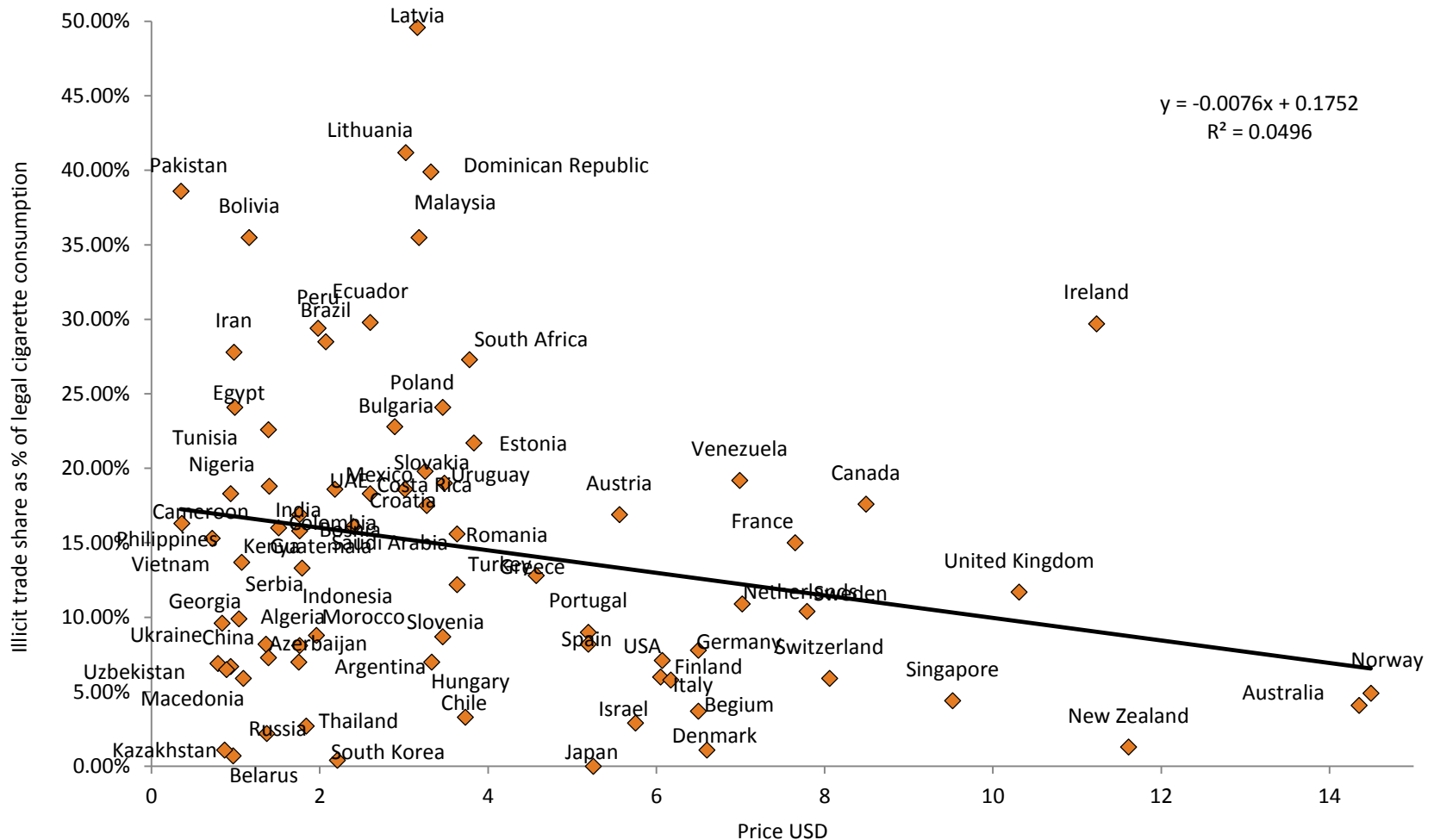


# Tax Avoidance & Evasion Do NOT Eliminate Revenue Impact of Higher Taxes

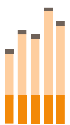
## Cook County Cigarette Tax and Tax Revenues - FY01-FY06



# Illicit Cigarette Market Share & Cigarette Prices, 2012



Sources: Euromonitor, WHO

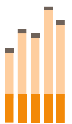




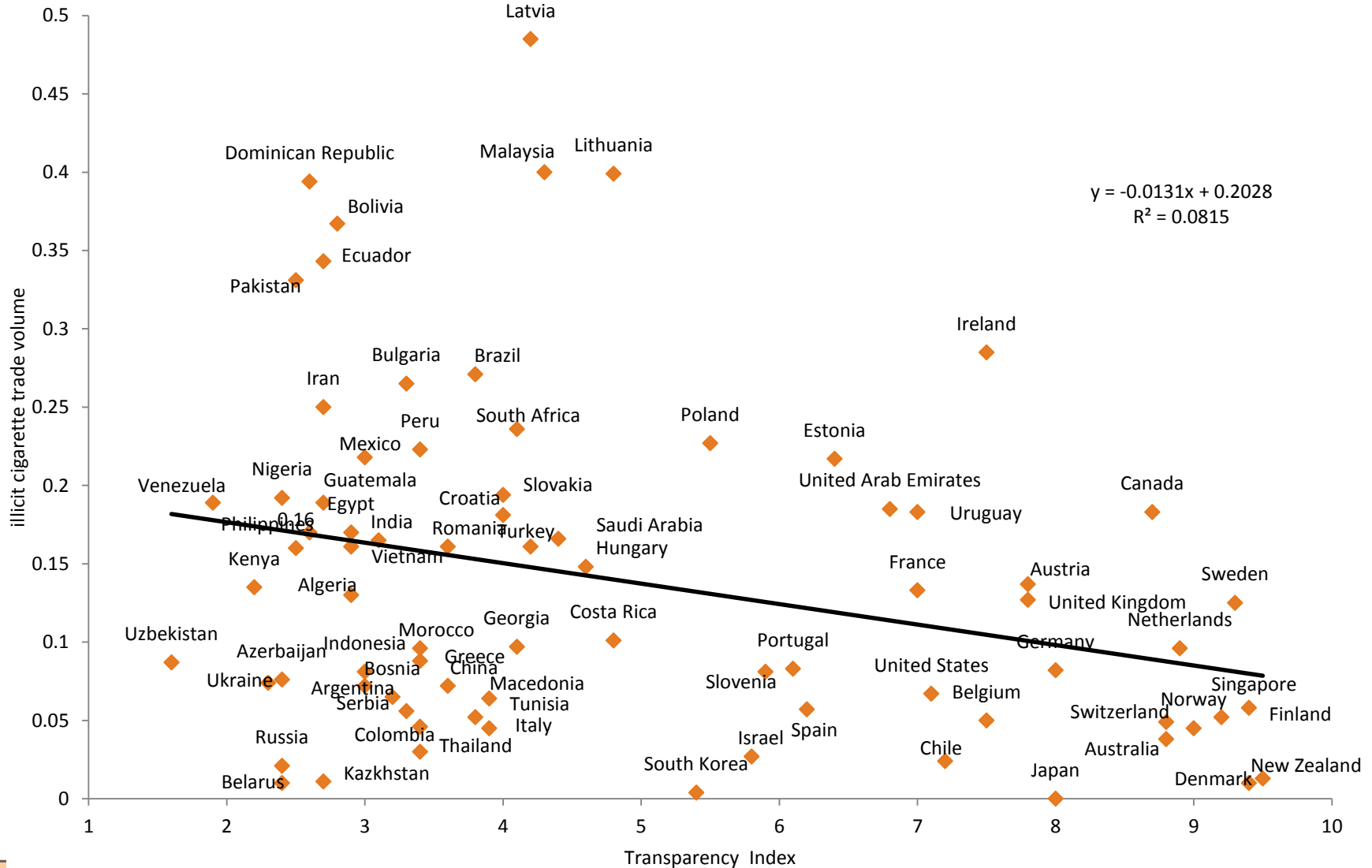
# Drivers of Illicit Tobacco

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

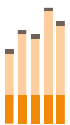
Sources: NRC/IOM 2015; NCI/WHO 2016



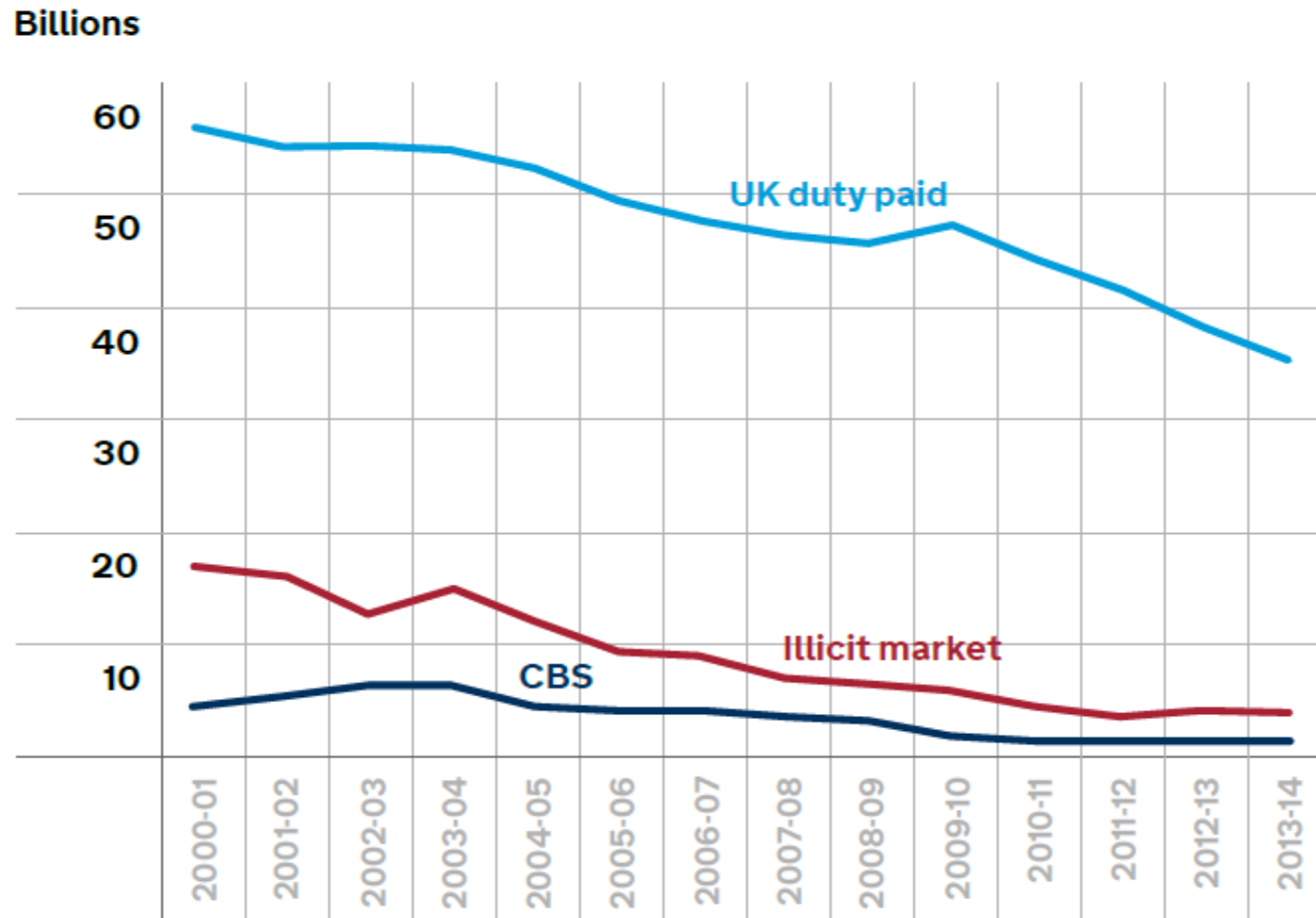
# Smuggling and Corruption, 2011



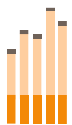
Sources: Euromonitor, Transparency International



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

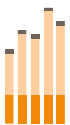


Source: HM Revenue & Customs, 2014



# Combating Illicit Tobacco Trade

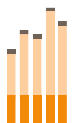
- Illicit trade protocol to the WHO FCTC
  - Adopted November 2012; entered into force September 2018; provisions calling for:
    - Strong tax administration
      - Prominent, high-tech tax stamps and other pack markings
      - Licensing of manufacturers, exporters, distributors, retailers
      - Export bonds
      - Unique identification codes on packages
    - Better enforcement
      - Increased resources
      - Focus on large scale smuggling
    - Swift, severe penalties
    - Multilateral/intersectoral cooperation

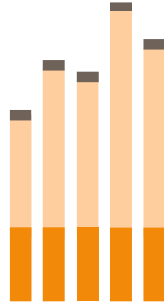


# Beverage Tax Avoidance & Evasion

Little evidence of significant tax avoidance & evasion

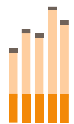
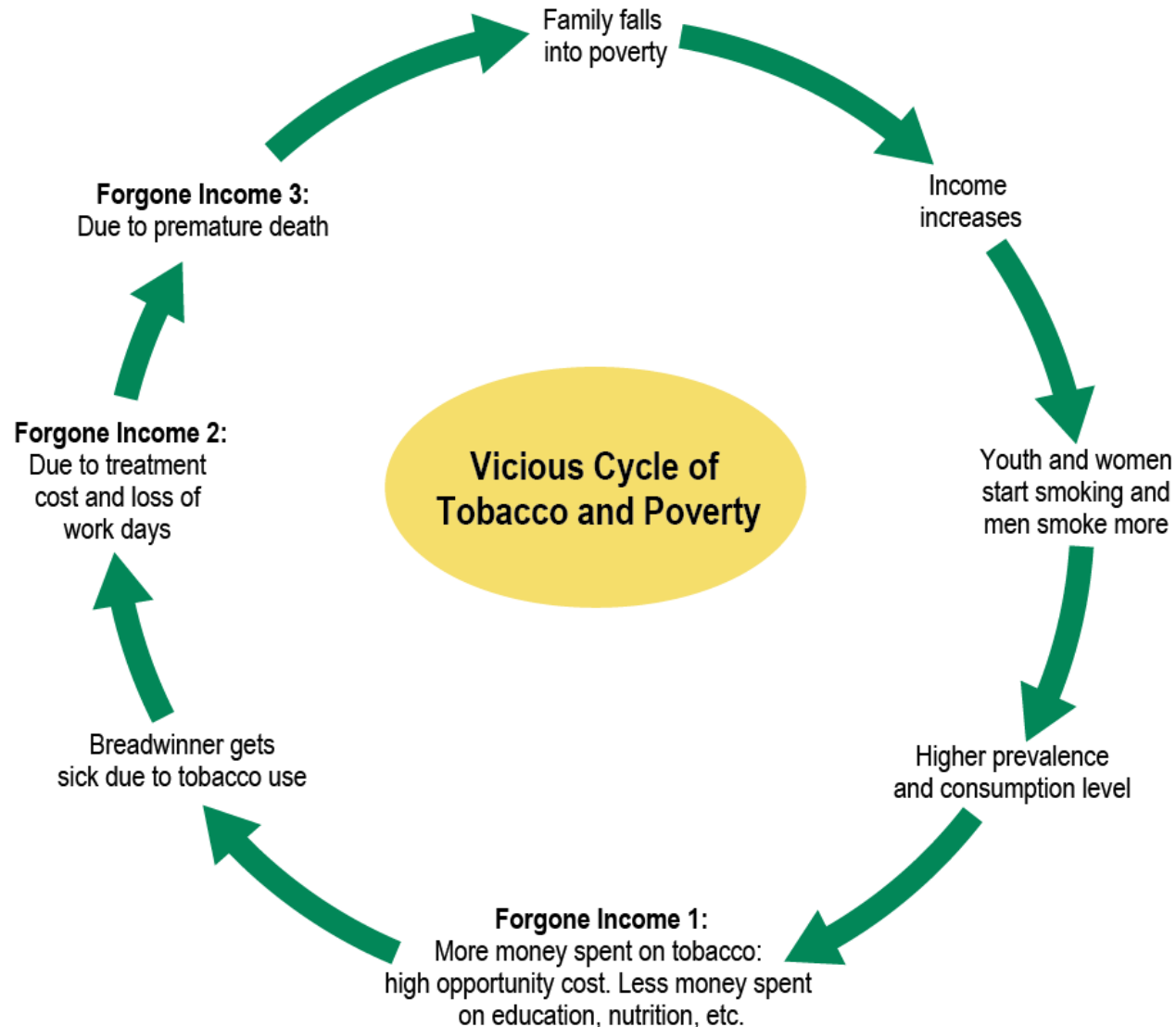
- low taxes relative to prices
- costly to avoid/evade taxes
- Ongoing research on alcoholic beverage tax avoidance and evasion





# Impact on the Poor

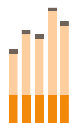
# Tobacco & Poverty



Source: NCI & WHO 2016

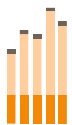
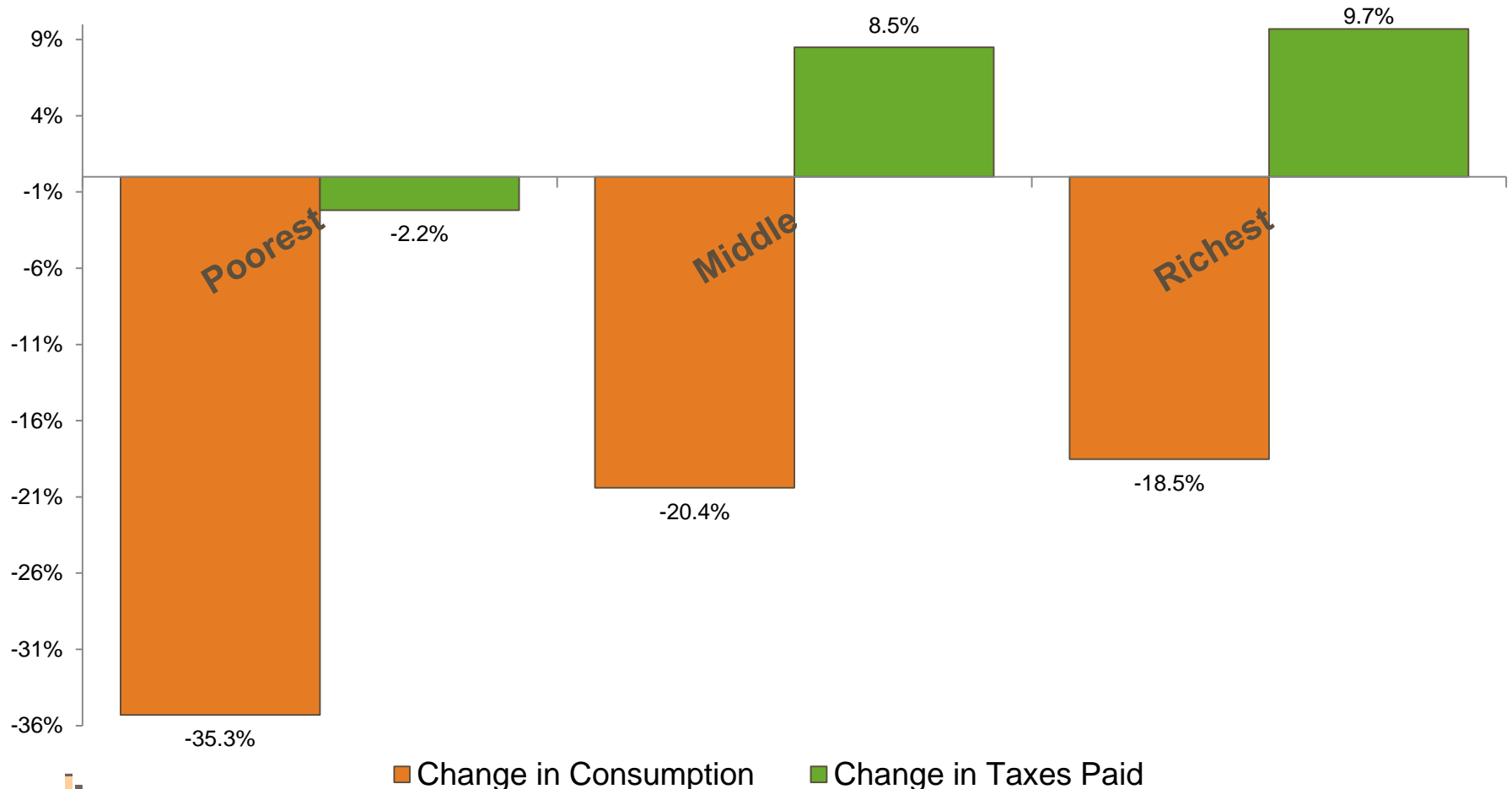
# Impact on the Poor

- **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



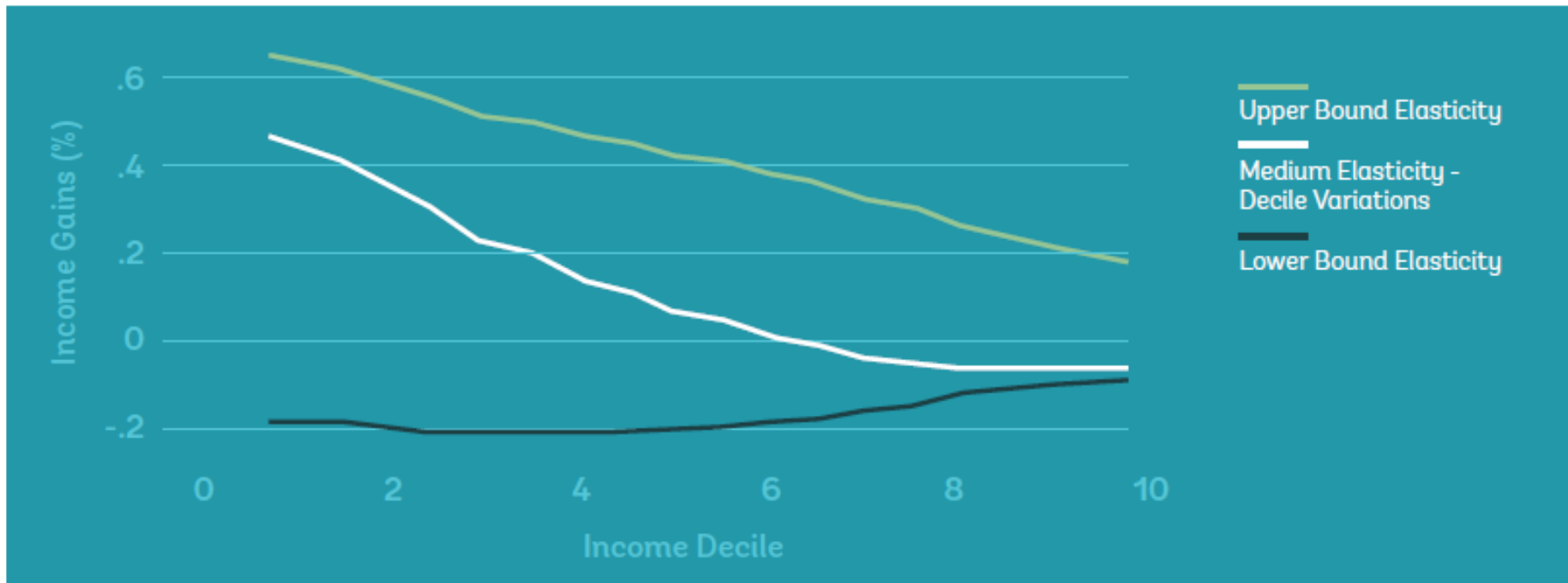


# Who Pays & Who Benefits Turkey, 25% Tax Increase

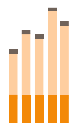


# Who Pays & Who Benefits Chile, 25% Tax Increase

Figure 6: Total Income Effect: Direct and Indirect Effect of Taxes  
(tobacco price increase, medical expenditure and working years gained)



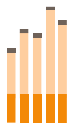
Source: Author's estimation using a price shock of 25%



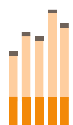
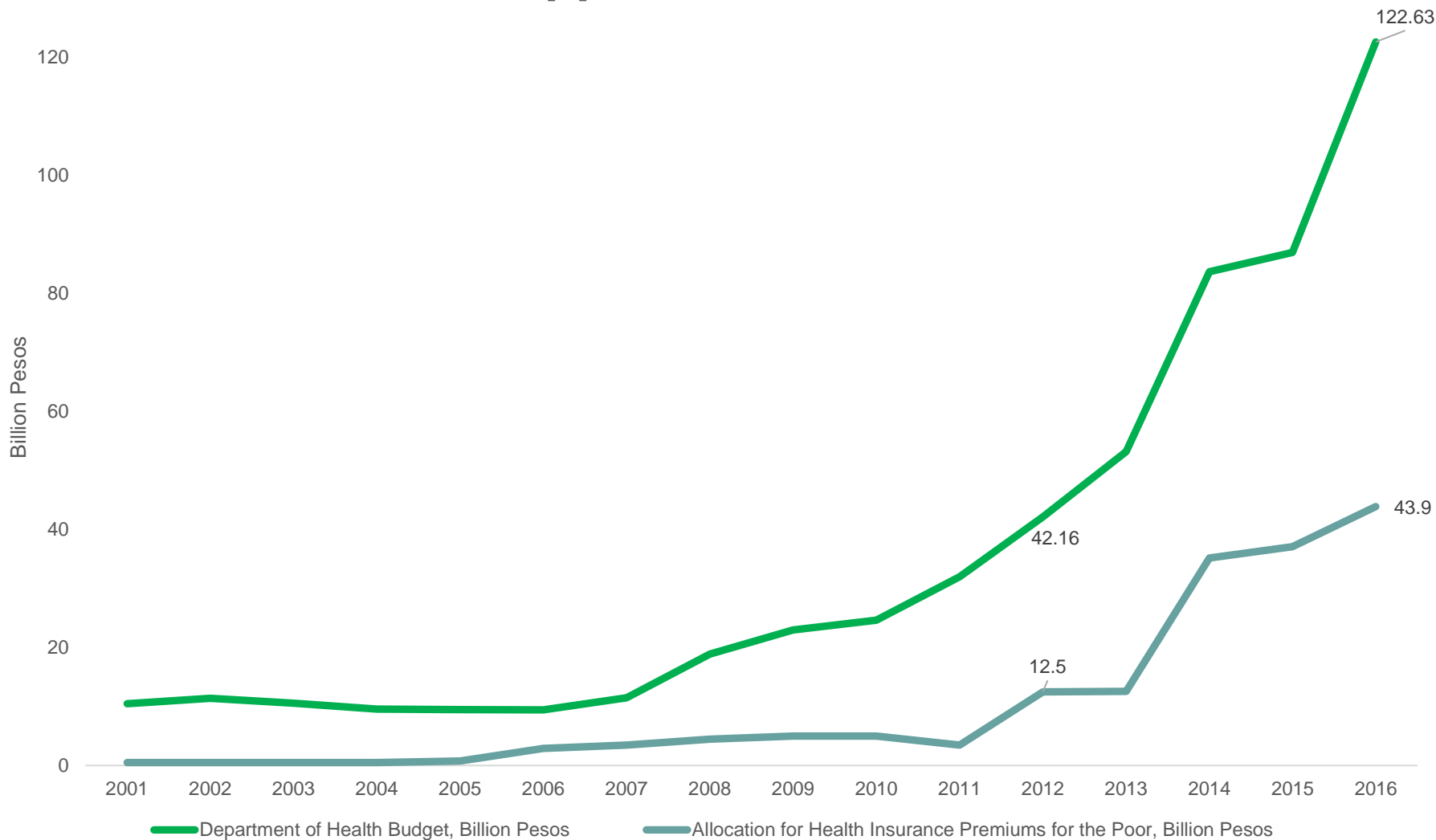
Source: Fuchs, et al., 2017

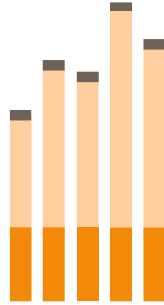
# Impact on the Poor

- 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



# Incremental Revenues for Health and the Poor Philippines, 2001-2016



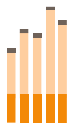


# Impact on the Economy

# Excise Taxes and Jobs

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

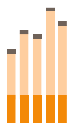
- employment in farming, manufacturing, distribution, retailing, and related sectors
- multiplier effects as income earned in these jobs is spent on other goods & services



# Excise Taxes and Jobs

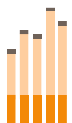
Industry-sponsored studies tell only part of story:

- 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

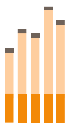




# Tobacco Taxes and Jobs

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



Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

## Preventive Medicine

journal homepage: [www.elsevier.com/locate/ypmed](http://www.elsevier.com/locate/ypmed)

## Employment changes associated with the introduction of taxes on sugar-sweetened beverages and nonessential energy-dense food in Mexico

Carlos M. Guerrero-López, Mariana Molina, M. Arantxa Colchero\*

Center for Health Systems Research, Instituto Nacional de Salud Pública, Universidad No. 655 Colonia Santa María Ahuacatitlán, Cerrada Los Pinos y Caminera C.P. 62100, Cuernavaca, Mor., Mexico

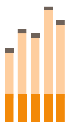
### ARTICLE INFO

**Keywords:**

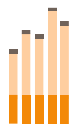
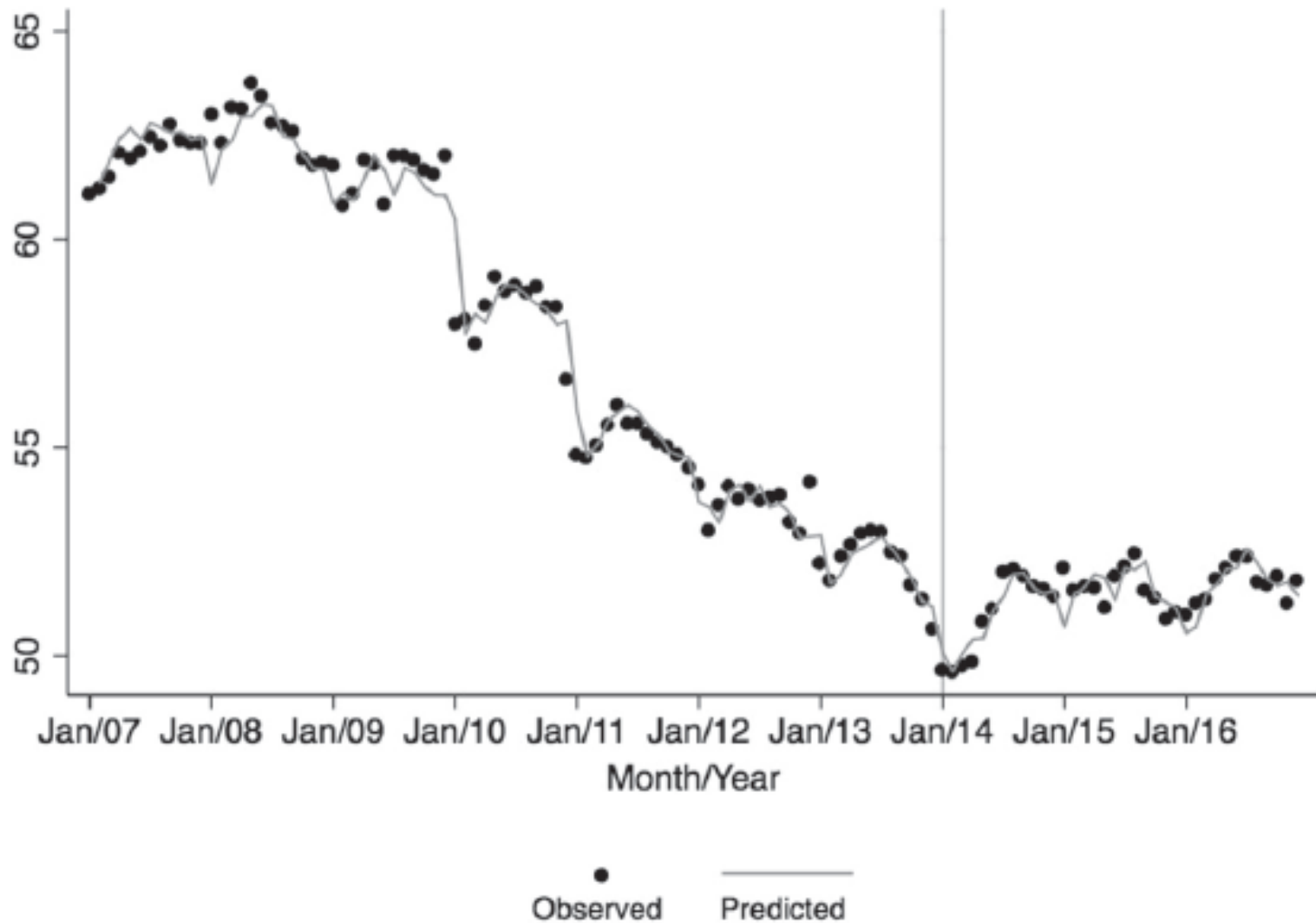
Employment  
Taxes  
Mexico  
Evaluation  
Policy  
Obesity

### ABSTRACT

We assessed changes in employment in the manufacturing industry, the commercial sector and national unemployment rates, associated with the fiscal policies implemented in 2014 in Mexico: a 1 peso per liter excise tax to sugar-sweetened beverages (SSB) and an 8% tax on nonessential energy-dense food. We used data from three nationally representative surveys. Controlling for contextual variables, we used interrupted time series analyses to model changes in number of employees in the SSB and nonessential energy-dense food industry, in commercial establishments selling beverages and food and changes in national unemployment rates. Our results show that there were no significant changes in employment associated with the taxes in the manufacturing industries (for beverages and nonessential energy-dense food). We found a very small increasing trend in the post-tax period for employment in commercial stores and a decreasing trend in the unemployment rate. However, these changes are negligible and unlikely to be caused by the implementation of the taxes. In conclusion, there were no employment reductions associated with the fiscal policies implemented in Mexico in 2014 on SSB and nonessential energy-dense food.



## A- Sugar-sweetened beverages industry



Thousands of employees, Mexico, 2007-2016; Guerrero-Lopez, et al., 2017

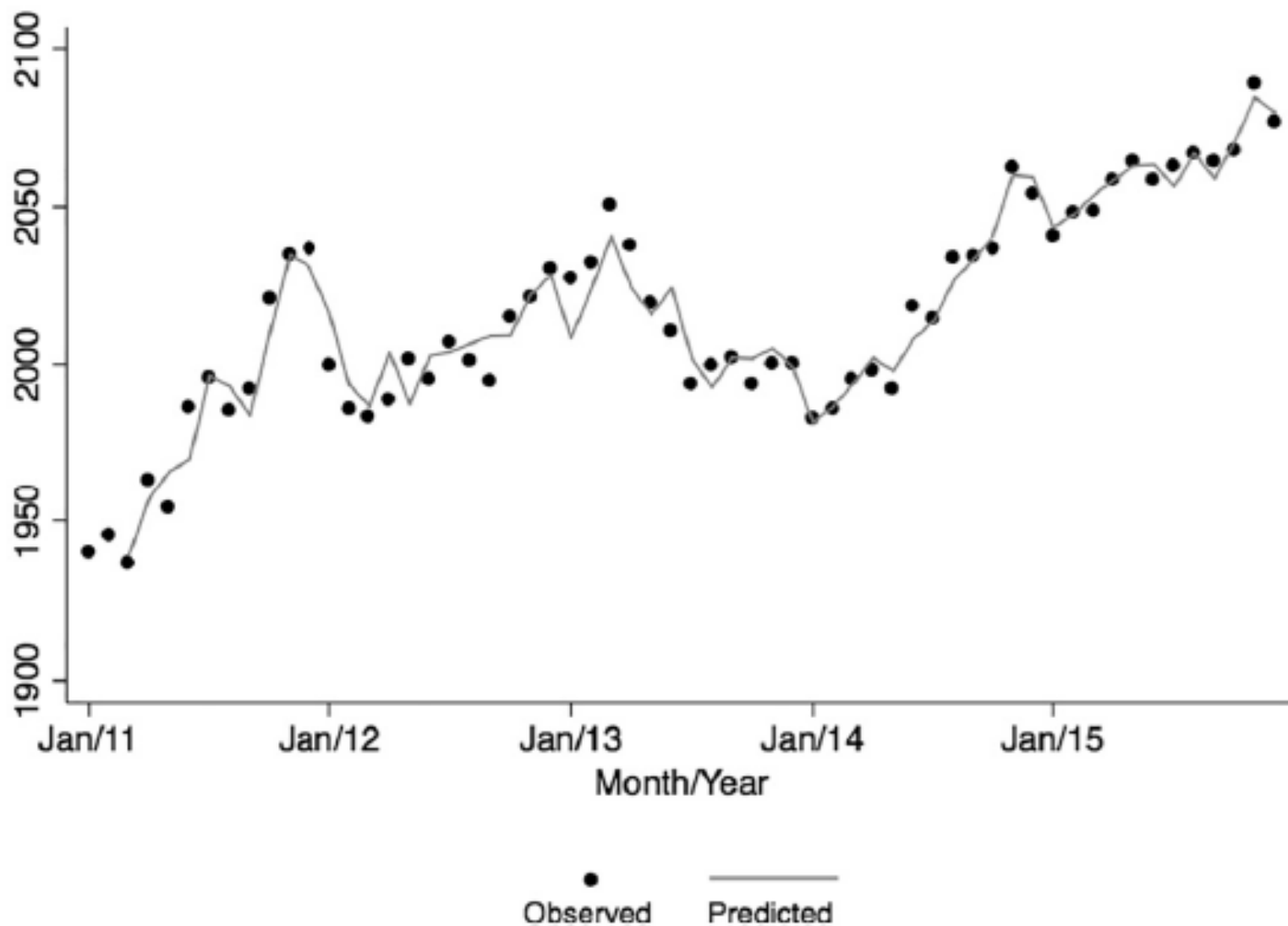
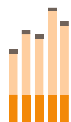


Fig. 2. Thousands of employees in commercial establishments. Mexico, EMEC, 2011–2015.



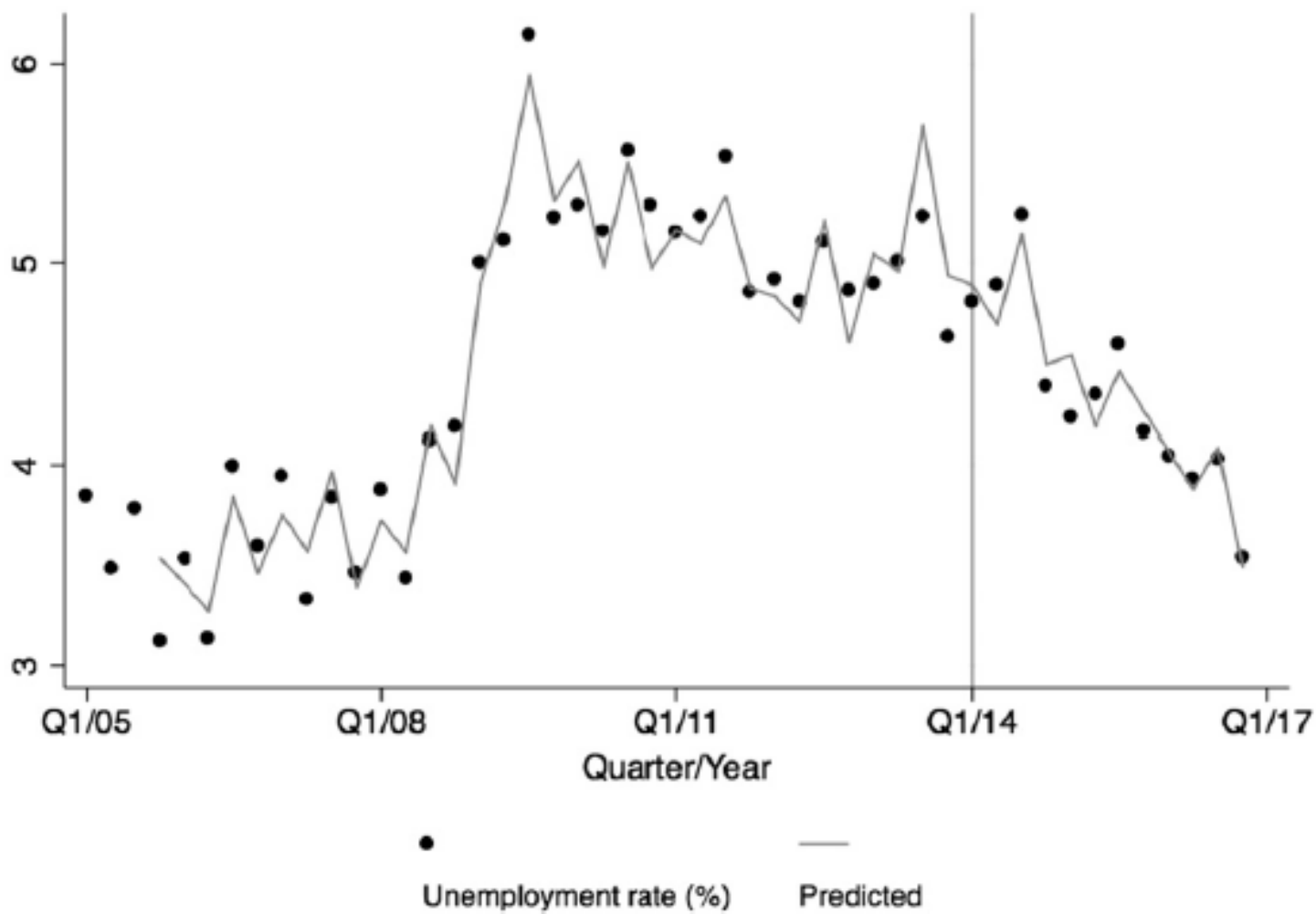
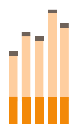


Fig. 3. National unemployment rate. Mexico, ENOE 2005–2016.



# Employment Impact of Sugar-Sweetened Beverage Taxes

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

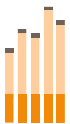
Sugar-sweetened beverages (SSBs) are the leading source of added sugar in the American diet and are associated with increased risk of type 2 diabetes, cardiovascular disease, dental caries, osteoporosis, and obesity.<sup>1-4</sup> From 1988-1994 to 1999-2004, average daily caloric intake of SSBs increased from 157 to 203 kilocalories among adults and from 204 to 224 kilocalories among children aged 2 to 19 years.<sup>5,6</sup> 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 ( $\geq 500$  kcal/day) increased among children.<sup>2,7</sup> 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)





Contents lists available at ScienceDirect

## Preventive Medicine

journal homepage: [www.elsevier.com/locate/ypmed](http://www.elsevier.com/locate/ypmed)Employment impacts of alcohol taxes<sup>☆</sup>Roy Wada<sup>a</sup>, Frank J. Chaloupka<sup>b,c,\*</sup>, Lisa M. Powell<sup>b,c</sup>, David H. Jernigan<sup>d</sup><sup>a</sup> Boston Public Health Commission, 1010 Massachusetts Avenue, 6th Floor, Boston, MA 02118, United States<sup>b</sup> Health Policy Center, Institute for Health Research and Policy, University of Illinois at Chicago, MC 275, 1747 W. Roosevelt Road, Chicago, IL 60608, United States<sup>c</sup> Health Policy and Administration, School of Public Health, University of Illinois at Chicago, Chicago, IL 60608, United States<sup>d</sup> Department of Health, Behavior and Society, Bloomberg School of Public Health, The Johns Hopkins University, Baltimore, MD 21205, United States

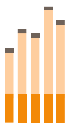
## ARTICLE INFO

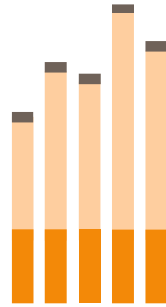
## Keywords:

Alcohol taxes  
Excise taxes  
Sales taxes  
Employment

## ABSTRACT

There is strong scientific evidence supporting the effectiveness of increasing alcohol taxes for reducing excessive alcohol consumption and related problems. Opponents have argued that alcohol tax increases lead to job losses. However, there has been no comprehensive economic analysis of the impact of alcohol taxes on employment. To fill this gap, a regional macroeconomic simulation model was used to assess the net impact of two hypothetical alcohol tax increases (a 5-cent per drink excise tax increase and a 5% sales tax increase on beer, wine, and distilled spirits, respectively) on employment in Arkansas, Florida, Massachusetts, New Mexico, and Wisconsin. The model accounted for changes in alcohol demand, average state income, and substitution effects. The employment impact of spending the new tax revenue on general expenditures versus health care was also assessed. Simulation results showed that a 5-cent per drink additional excise tax on alcoholic beverages with new tax revenues allocated to general expenditures increased net employment in Arkansas (802 jobs); Florida (4583 jobs); Massachusetts (978 jobs); New Mexico (653 jobs); and Wisconsin (1167 jobs). A 5% additional sales tax also increased employment in Arkansas (789 jobs); Florida (4493 jobs); Massachusetts (898 jobs); New Mexico (621 jobs); and Wisconsin (991 jobs). Using new alcohol tax revenues to fund health care services resulted in slightly lower net increases in state employment. The overall economic impact of alcohol tax increases cannot be fully assessed without accounting for the job gains resulting from additional tax revenues.



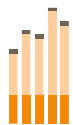


# Summary & Ongoing Activities



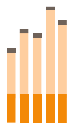
# Summary

- Demand for addictive products responds to changes in monetary prices and other costs of consuming
- Tax and other policies targeting demand for addictive and/or unhealthy products are effective in reducing use and related health and economic consequences
- Counterarguments about negative economic impact of taxes and other control policies false or greatly overstated



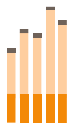
# Economic Research Priorities for Tobacco

- Country specific research on impact of tax/price on tobacco use in LMICs
- Research on the economic costs and benefits of tobacco taxation and tobacco control
- Research on the interrelationships between tobacco use, poverty, and tobacco control
- Other:
  - In small number of highly tobacco-dependent countries, research on economically viable alternatives to tobacco growing and manufacturing
  - In HICs, research to assess changes in price elasticity of tobacco products over time and at different tax/price levels



# Bloomberg Initiative – UIC

- Work with ‘think tanks’ in selected countries and regions to develop local evidence on the impact of tobacco tax reforms and tax increases
- Strategic engagement with decision makers to build technical capacity on tobacco tax policy
- Develop/disseminate resources (policy briefs, white papers, etc.) on tobacco taxation to build knowledge about effective tobacco tax policy



# UIC Bloomberg Initiative Partners



# THANK YOU!

For more information:

Tobacconomics:

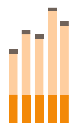
<http://www.tobacconomics.org>

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Bridging the Gap:

<http://www.bridgingthegapresearch.org>

fjc@uic.edu



**tobacconomics**

Economic Research Informing Tobacco Control Policy

Policy Brief | August 2018

## Tobacco Taxation Can Reduce Tobacco Consumption and Help Achieve Sustainable Development Goals

### Introduction

A substantial body of research shows that significantly increasing the taxes and prices of tobacco products is the single most effective way to reduce tobacco use and its devastating health consequences.<sup>i</sup> A tax increase that raises prices by 10% can reduce tobacco consumption on average by 5% in low and middle income countries (LMICs).<sup>ii</sup>

Tobacco also poses a threat to development, especially in the LMICs that have the highest rates of tobacco use. The global economic costs from smoking due to medical expenses and lost productivity in 2012 alone totaled over \$1.4 trillion dollars.<sup>iii</sup>

Besides the growing recognition of the obvious harmful effects of tobacco on health and healthcare, there is a noticeable international movement recognizing the harmful effects of

tobacco use on sustainable development. The United Nations (UN) 2030 Agenda for Sustainable Development has set 17 Sustainable Development Goals (SDGs) and 169 related targets. One of those targets focuses specifically on tobacco, and urges “strengthened implementation of the Framework Convention on Tobacco Control (FCTC).” The FCTC is an international treaty created under the auspices of the World Health Organization (WHO). It focuses on reducing the demand and supply of tobacco products. In order to finance the SDGs, the Addis Ababa Action Agenda of the Third International Conference on Financing for Development noted that “price and tax measures on tobacco can be an effective and important means to reduce tobacco consumption and healthcare costs and represent a revenue stream for financing for development in many countries”.

Raising tobacco excise tax by 1 International Dollar (about US\$ 0.80) in all countries would:



Source: WHO