The Health Economics of Bads

University of Alabama

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Last Class

- For-Profit and Nonprofit Hospitals
- Nonprofits emerged due to concerns that for-profit hospitals would lose sight of providing high quality care (focusing all energy into efficiency and profit maximization), due to market failures related to asymmetric information, and to address needed provision of a public good.
- About 70% of hospital care is performed by nonprofits.
- Theoretical model of a for-profit, monopolist hospital that maximizes profits by choosing some combination of quantity and quality of care
- Newhouse (1970) model of a nonprofit hospital in which the hospital's board of trustees maximize utility subject to a quantity-quality frontier.

The Health Economics of Bads

- In health, we are concerned about morbidity (the spread of disease) and mortality rates.
- According to the CDC, up to 40% of annual deaths from each of the five leading causes of death (heart disease, cancer, chronic lower respiratory diseases, stroke, and unintentional injuries) in the U.S. are preventable.
- Bad behaviors such as smoking, drinking, drunk driving, etc. contribute to many of these deaths.
- Often times, these bad behaviors can impact others both financially and in terms of health.

The Health Economics of Bads

- Generally, within society we value the consumer's sovereignty, i.e. the consumer is "free to choose" what to consume.
- There are some instances, however, in which we find it best to intervene by either encouraging or discouraging choices.
- For example, we encourage and promote use of motorcycle helmets, automobile emissions-control devices, old-age pensions, and good prenatal care.
- We often discourage the purchase of alcohol, street drugs, and cigarettes.
- The reasons for intervention may be to protect individuals from self-inflicted harm, but also there may be some reasons related to economic efficiency. This idea is related to externalities.

Externalities

- An externality is a side effect or consequence of an action or activity that affects outside parties in ways unrelated to the cost of the good or service.
- A common example is smoking. Cigarette smoking impacts not only the cigarette buyer and seller (effects that are internal to the cigarette market), but also the health of the nonsmokers nearby, an external cost.

Cigarette smoking can affect nonsmokers in a couple of different ways:

1. Breathing in secondhand smoke can be harmful to one's health
2. Due to high monitoring costs, many health insurers do not effectively distinguish between smokers and nonsmokers, and hence nonsmokers may pay higher premiums than warranted by their actual health risks.

Externalities

A second example is excessive alcohol consumption.

- The personal hazards of alcohol can be serious, including disability due to alcoholism and fatality due to liver disease. These are considered to be direct costs.
- The external costs include possible harm to family or neighbors as well as dangerous and often-fatal traffic accidents due to drunken driving.

Other examples of externalities include higher insurance premiums due to obesity (negative externality), and societal benefits of protection from illness due to vaccinations (positive externality).

Externalities

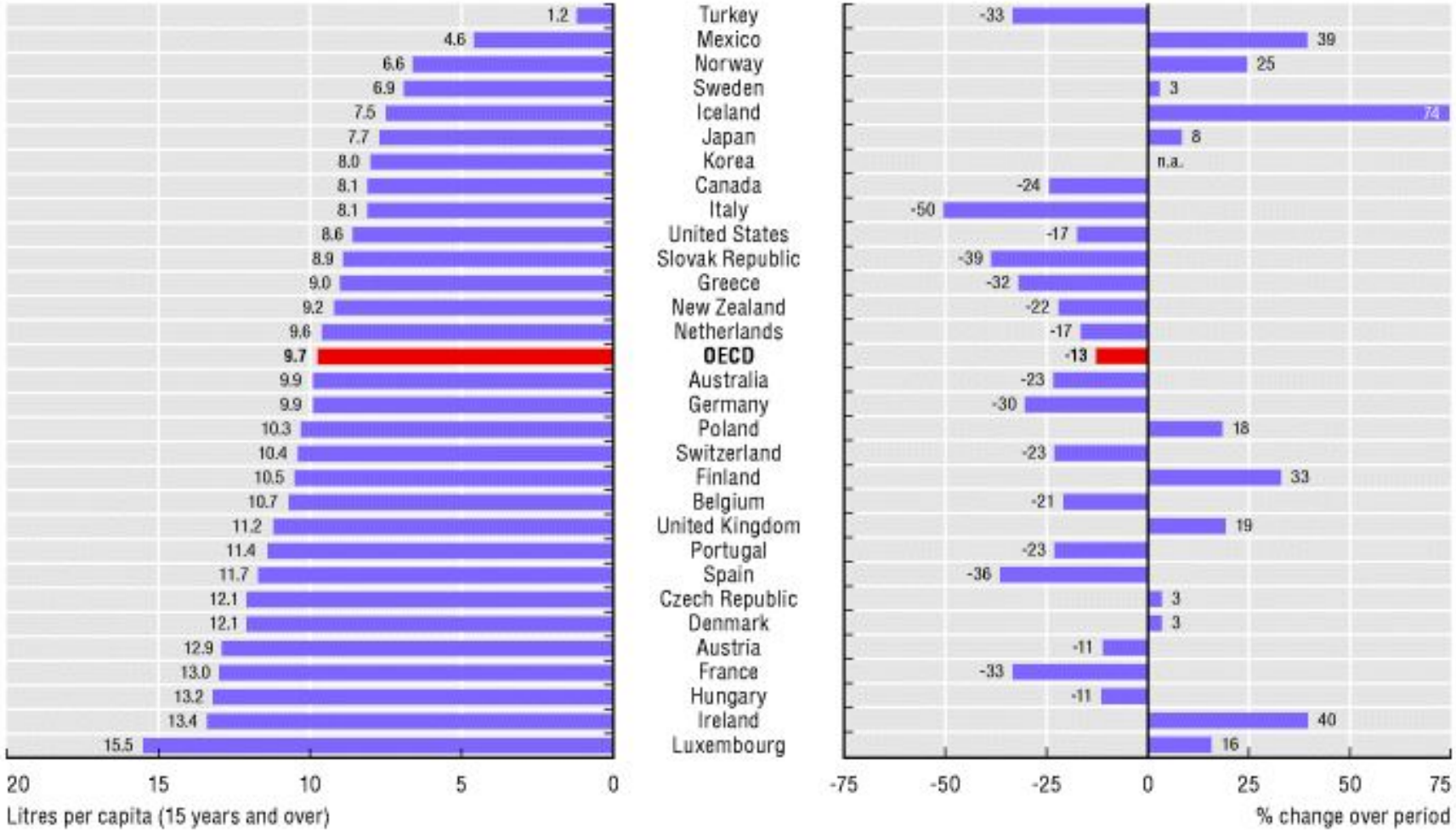
When smokers and drinkers underestimate the probabilities of ill health due to their consumption, the imperfect information provides an efficiency rationale for measures, such as taxes, that tend to curb the behaviors.

Some habits lead to social costs, i.e. externalities, and one approach is to use taxes to limit these social costs.

A separate approach may be to assume that society has no grounds to intervene if the consumer chooses rationally and voluntarily, understands the risks, and creates no side effects for others. This view rejects any arguments based on paternalism (protecting people from harming themselves).

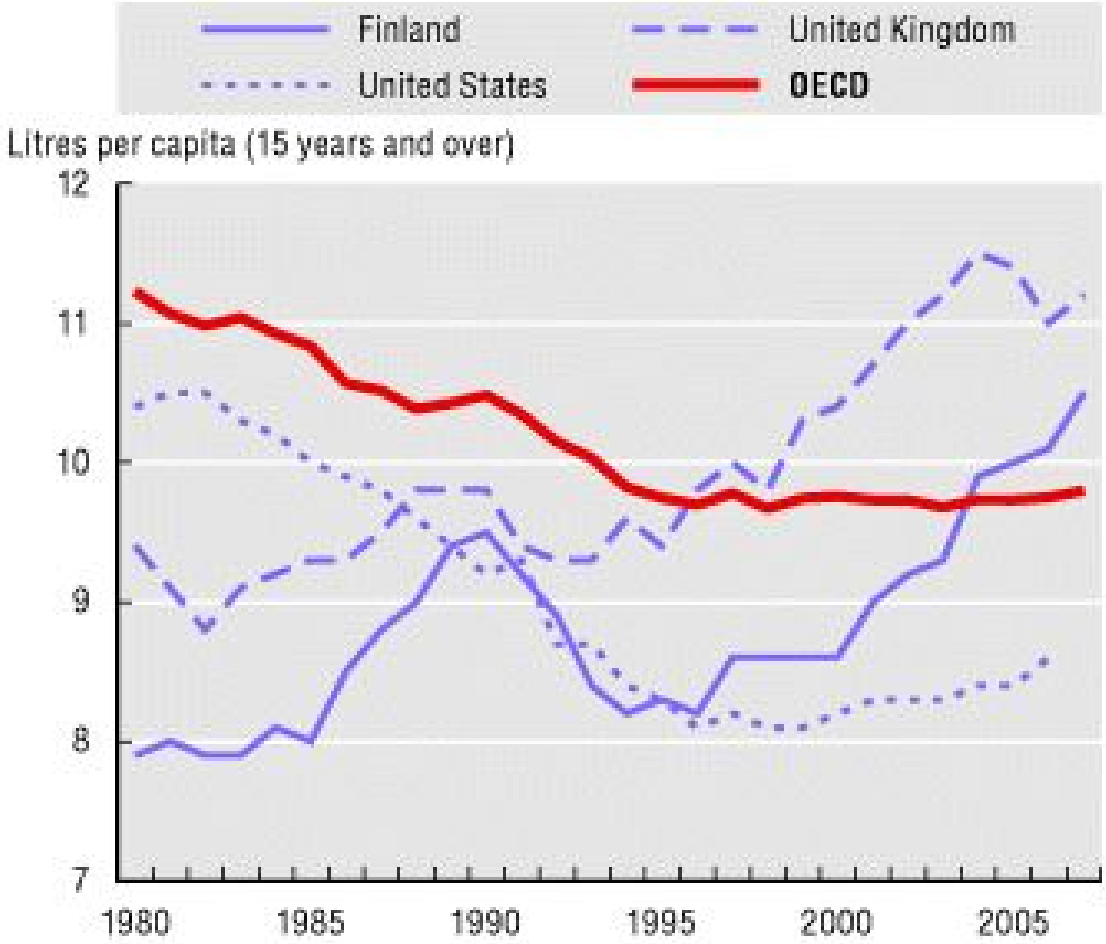
Because alcohol and cigarettes are addictive, this further confounds the moral question.

Figure 2.6.1. **Alcohol consumption, population aged 15 years and over, 2007 (or latest year available)**



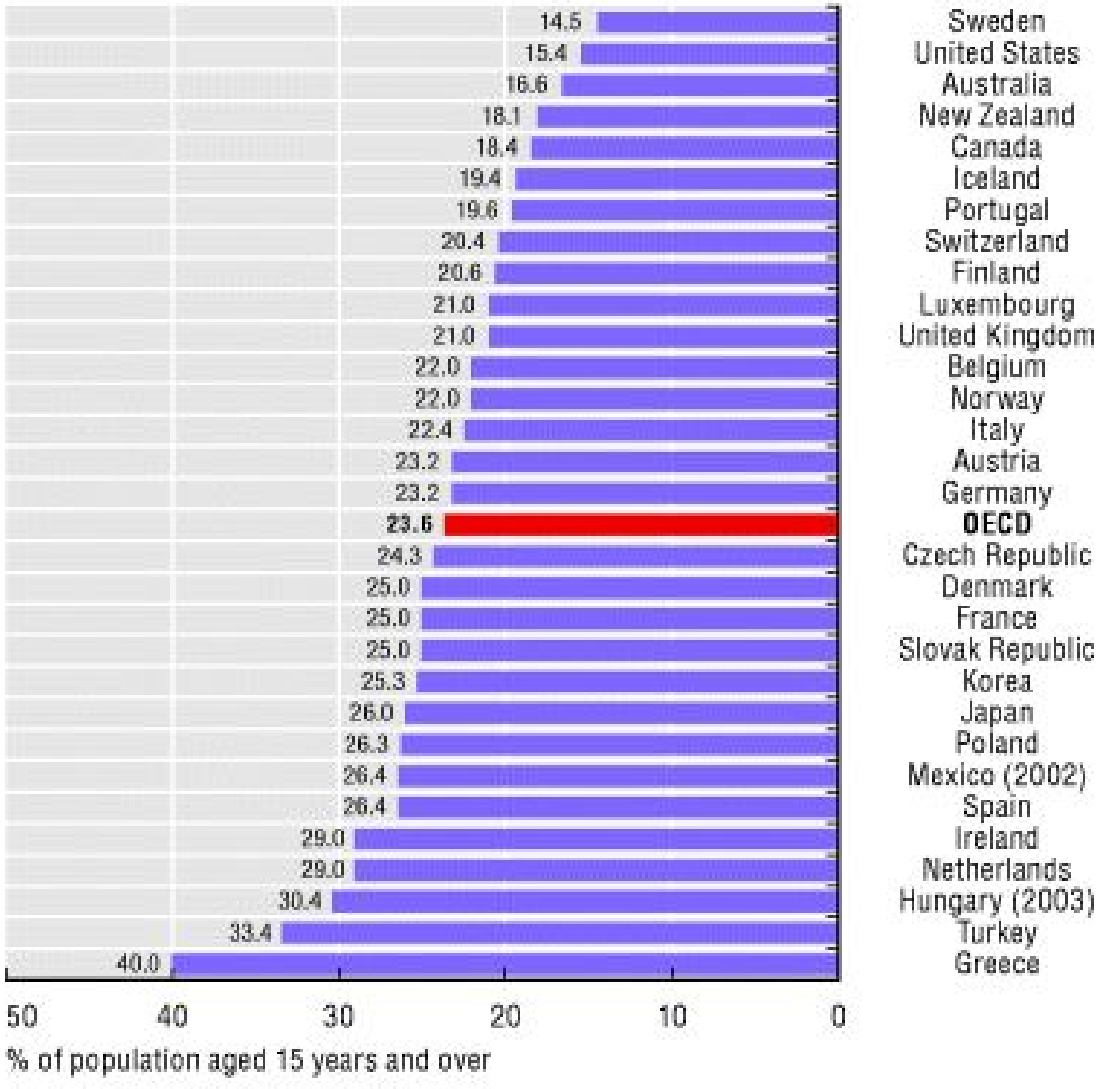
Source: *OECD Health Data 2009.*

Figure 2.6.3. **Trends in alcohol consumption, selected OECD countries, 1980-2007**



Source: *OECD Health Data 2009.*

Figure 2.5.1. **Percentage of adult population smoking daily, 2007 (or latest year available)**



Source: *OECD Health Data 2009.*

Economic Questions of Intervention

For many, with respect to smoking and drinking, the question is not whether we should intervene, but instead how can we do so in the most effective and unobtrusive way. Two economic questions emerge:

1. What is the relationship of price to demand?
   - i.e. if we impose a tax and raise the price, do people actually demand less alcohol or less cigarettes?
2. What is the relationship of product advertising to total consumption?
   - Perhaps by advertising against drinking and smoking we can deter many individuals from consuming harmful substances.

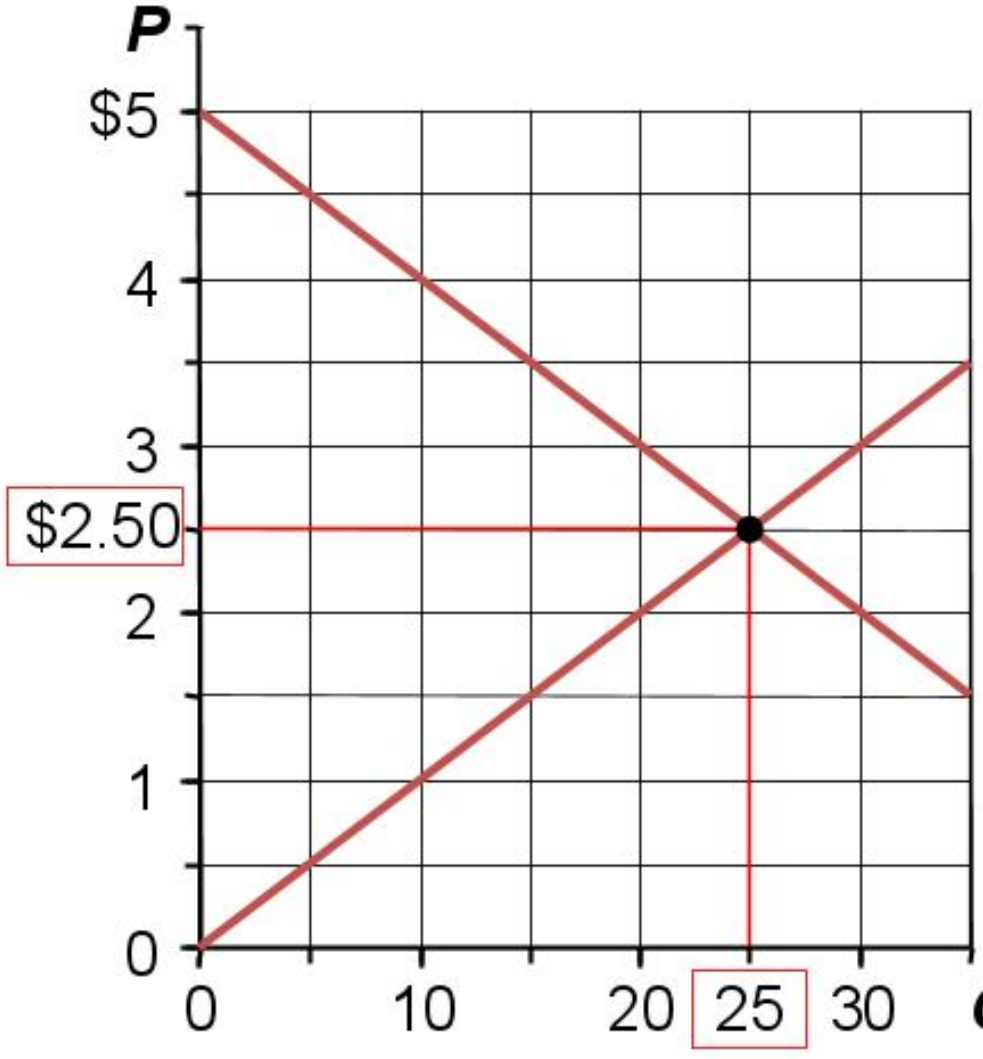
Models of Addiction

So if smoking is so bad, why do people still do it? Addiction plays a major role. Models of addiction come out of psychology, medicine, and economics literature.

There are three types of models of addiction:

1. Imperfectly Rational Addiction Models
   - The addict has stable but inconsistent preferences in the short run as opposed to the long run. For example, the addict knows that in the long run he needs to quit smoking, however gives in to temptation in the short run, and regrets the action after.
2. Myopic Addiction Models
   - The individual is misinformed or ignorant of the nature of the drug and its side effects.
3. Rational Addiction Models
   - Addicts reinforce present consumption by using past consumption. Addicts build tolerance by consuming more now in belief that utility from later consumption will be higher.

Economics of Negative Externalities

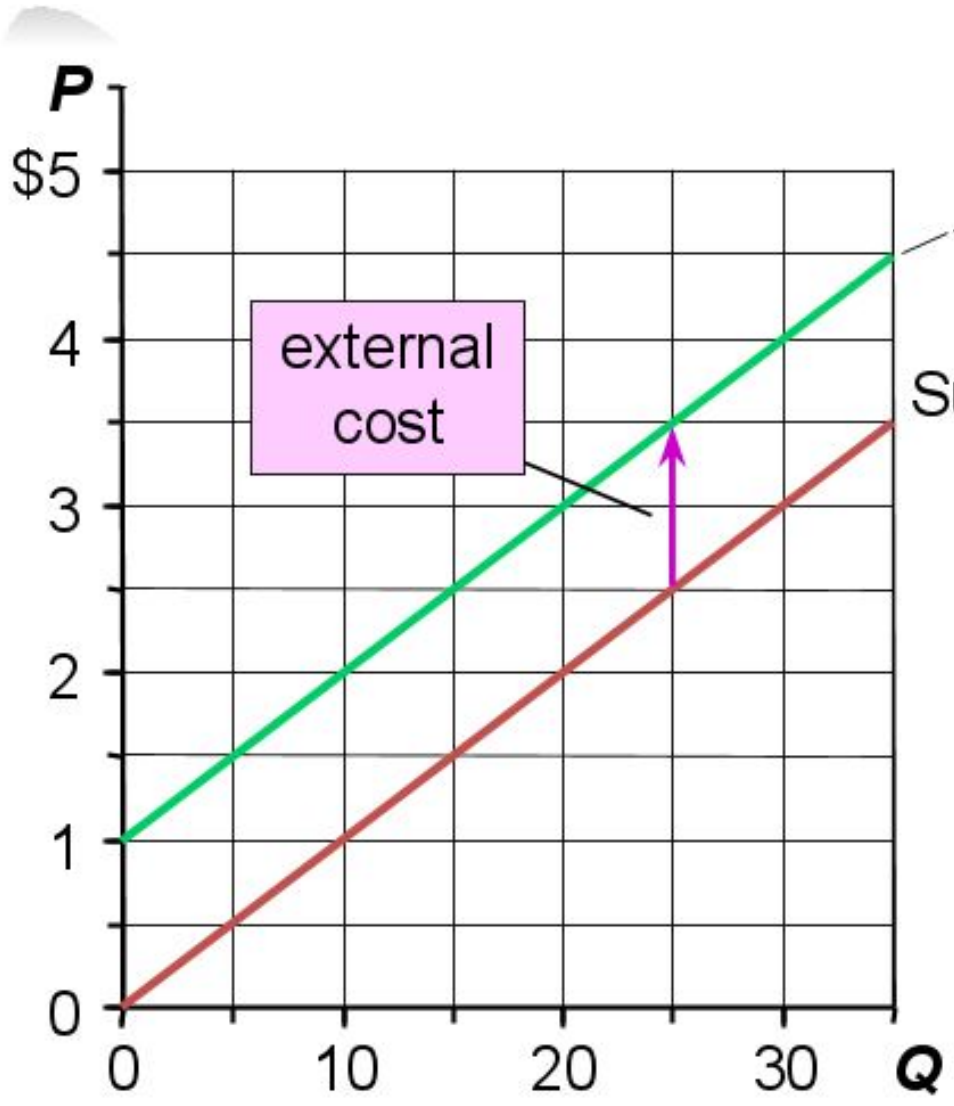


The market eq'm maximizes consumer + producer surplus.

Supply curve shows **private cost**, the costs directly incurred by sellers.

Demand curve shows **private value**, the value to buyers (the prices they are willing to pay).

Economics of Negative Externalities

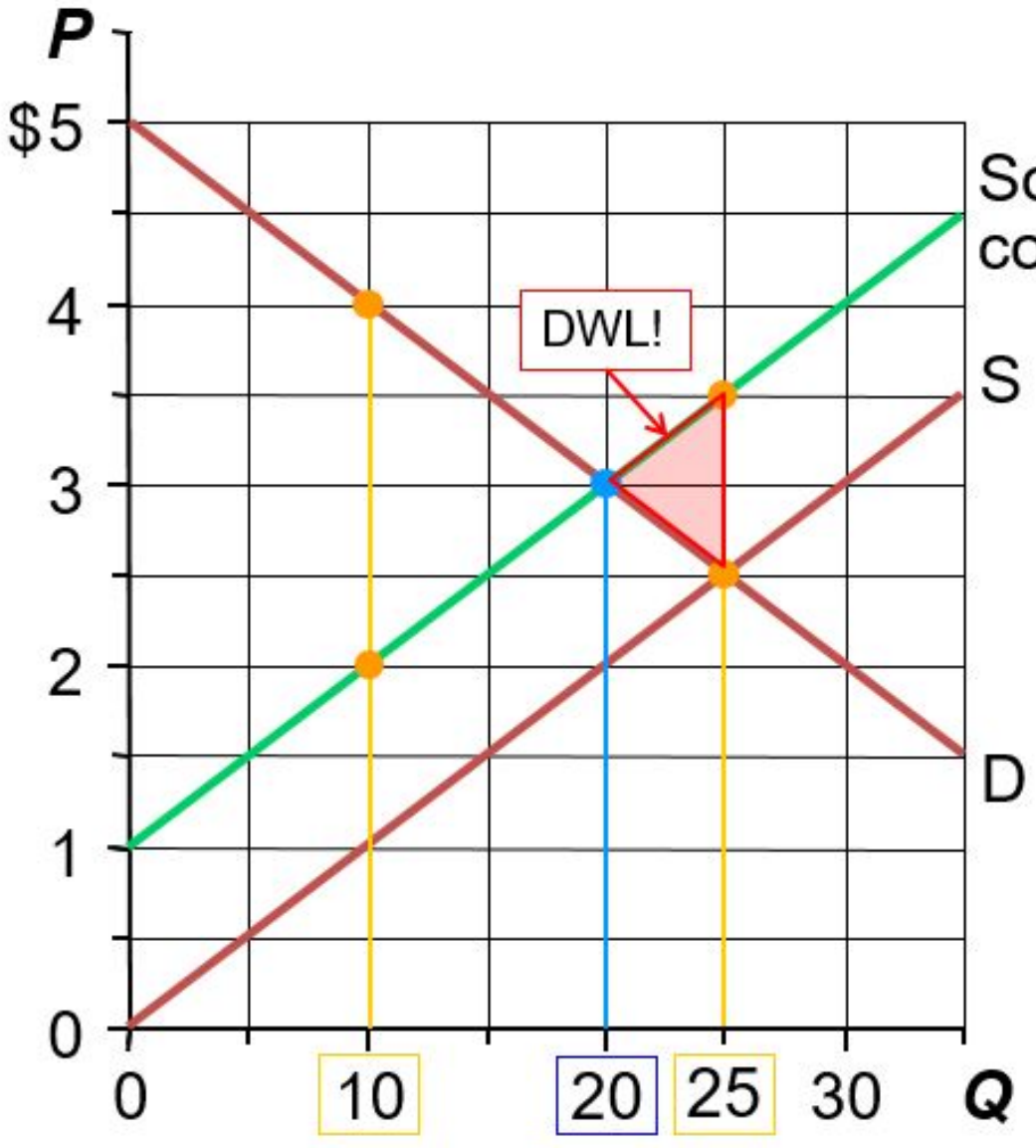


Social cost
= private + external cost

Supply (private cost)

External cost
= value of the negative impact on bystanders
= $1

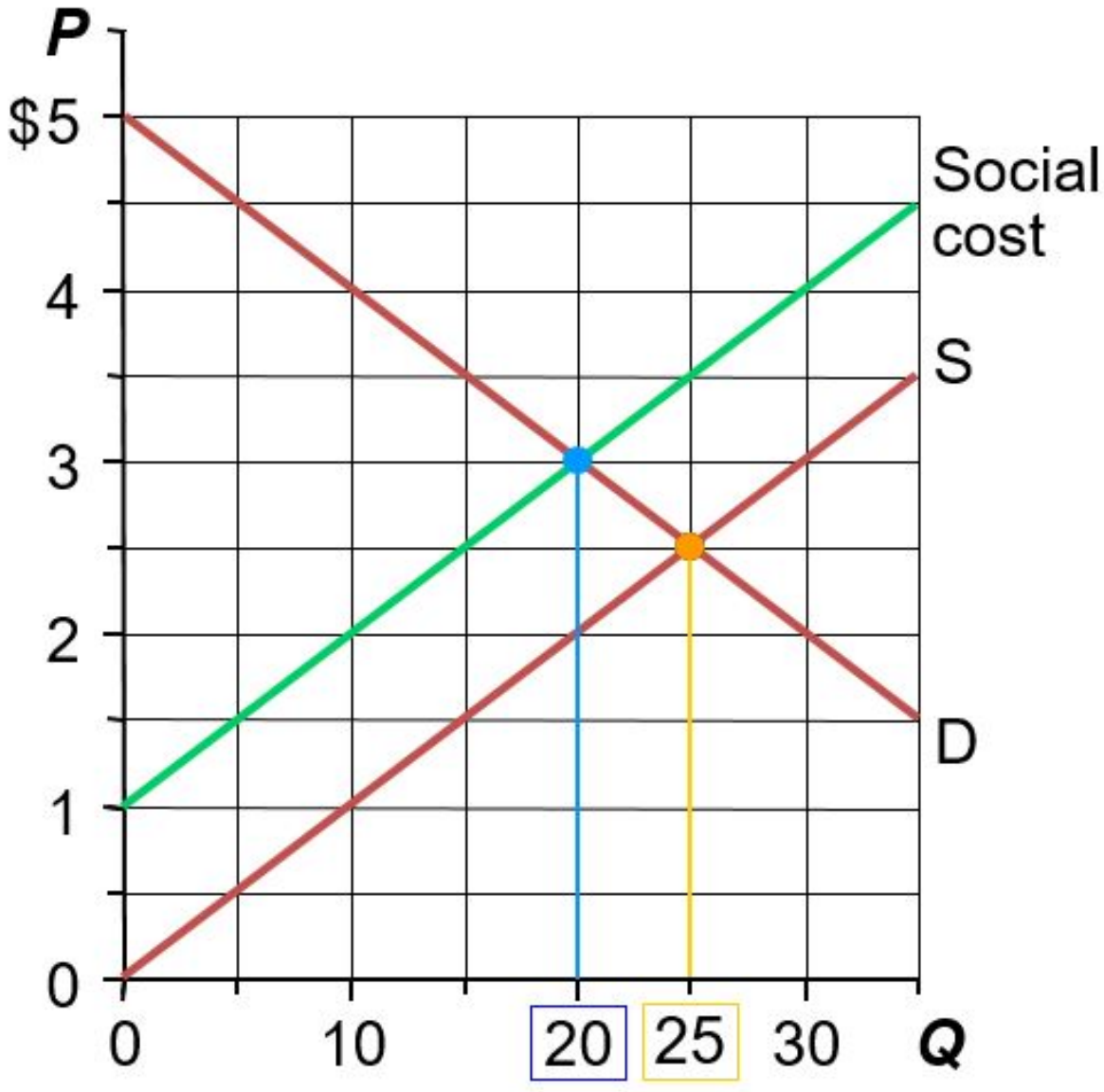
Economics of Negative Externalities



The socially optimal quantity is 20 units.

At any $Q < 20$, value of additional units exceeds social cost.

At any $Q > 20$, social cost of the last unit is greater than its value to society.



Market eq'm (***Q*** = 25) is greater than social optimum (***Q*** = 20).

One solution: tax sellers $1/unit, would shift ***S*** curve up $1.

Economics of Positive Externalities

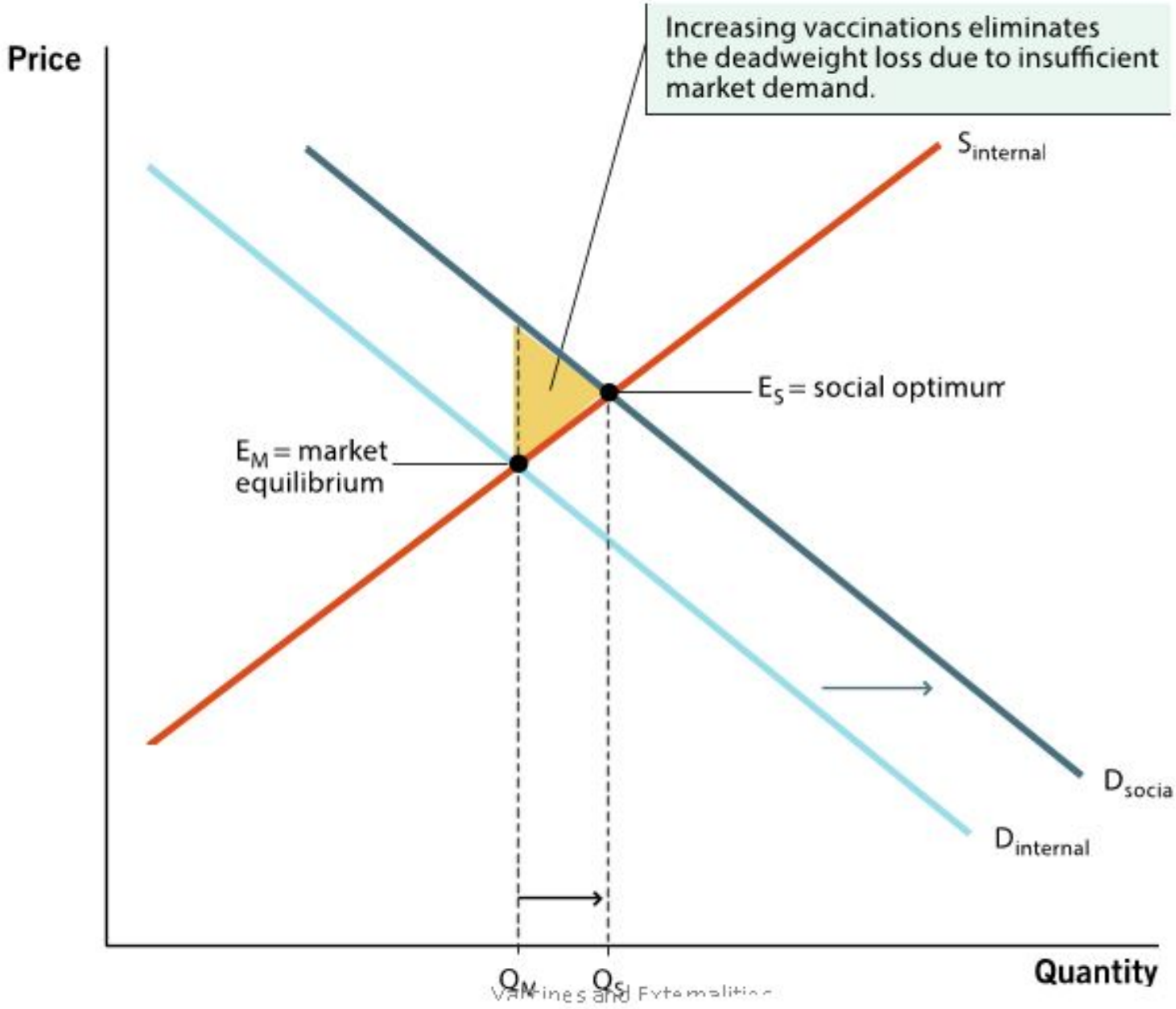
In the presence of positive externalities, the social value of a good includes:

1. Private value -the direct value to buyers.
2. External benefit -the value of the positive impact on bystanders.

The socially optimal Q maximizes welfare:

- At any lower Q, the social value of the additional units exceeds their costs.
- At any higher Q, the cost of the last unit exceeds its social value.

Economics of Positive Externalities



Government Intervention

There is a loss of efficiency due to economic bads and negative externalities, so there may be a role for government to lessen this welfare loss. At the same time, however, the government must consider what is equitable, and not intervene too drastically in a manner that harms consumer rights. Recall the equity-efficiency tradeoff, it is present within discussions of externalities as well.

The government effectively has two intervention strategies:

1. Advertisement Restrictions
2. Excise taxes

Note: the government has tried more drastic intervention in the past (prohibition of alcohol in the 1920s), and this did not work too well.

Advertising Restrictions

- If we limit the type and quantity of advertisements for cigarettes and alcohol, and actually promote anti-consumption ads, does this lead to decreased consumption?
- Many believe that advertisements have no effect on consumption.
- Alternatively, there is a lot of literature suggesting that advertising better informs consumers, increases brand loyalty, and increases consumption.
- With respect to smoking, estimated elasticies relating advertisements to consumption are quite small.
- In the 1970s, negative advertisements regarding smoking were believed to be effective in reducing smoking in the population.

Advertising Restrictions

- With respect to alcohol consumption, some studies have found that advertising is an effective means to decrease drinking.
- One study found advertising to be especially effective on youthful drinkers; they estimated that a complete ban on all alcohol advertising could reduce adolescent alcohol consumption by 24% with even stronger effects on binge drinking (consuming excessive amounts of alcohol in a short period of time).
- A separate study found a positive correlation with alcohol advertisements and motor vehicle fatalities; they estimated that partial bans (bans on broadcast advertising) would reduce annual fatalities by 2,000 to 3,000, while a total ban could reduce fatalities by up to 10,000.

Excise Taxes

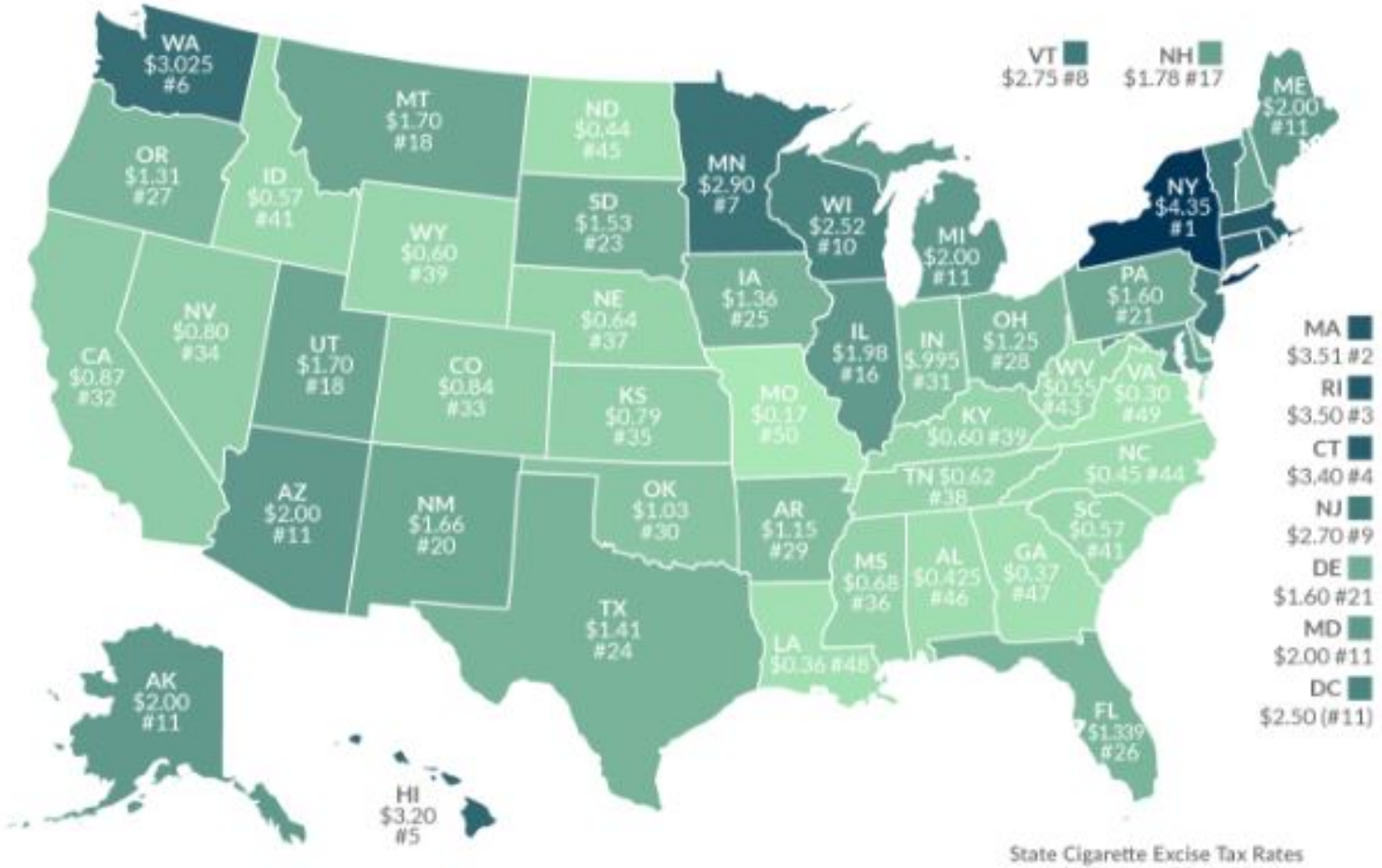
- The second tool used by the government to discourage bad behaviors is excise taxes.
- An excise tax is considered to be an indirect tax that gets levied on the producer, however typically people believe that the producer will forward the cost of this tax onto consumers.
- A related concept is that of a Pigouvian tax, or a tax levied on any market activity that generates negative externalities.
- Sometimes these taxes are also referred to as "sin taxes."
- We typically think of taxes on cigarettes or alcohol as Pigouvian excise taxes, or excise taxes used by the government to raise revenue.

Excise Taxes

- Alcohol and cigarettes are taxed at the federal, state, and local levels.
- Several states sell liquor rather than tax it (including Virginia and Pennsylvania).
- Most of the taxes are excise taxes levied on each unit of consumption
  - Rates may differ depending on the type of alcohol and the alcohol content.
  - Cigarettes are generally all taxed the same.
- In 2014, state sin tax revenues exceeded $32 billion, making up about 4% of total revenue (this includes taxation of gambling).

How High Are Cigarette Taxes in Your State?

State Cigarette Excise Tax Rates as of Jan. 1, 2015 (dollars per 20-pack)



Note: Local taxes are not included and can be substantial. DC's rank does not affect other states' rankings, but the figure in parentheses indicates where it would rank if included.

Source: RJ Reynolds; state revenue departments.

Cigarette Excise Tax Rates

States:

- Low: MO ($0.17), VA ($0.30), LA ($0.37), ND ($0.44)
- High: NY ($4.35), CT ($3.90), RI ($3.75), MA ($3.51)
- Average of $1.65 across all states. Average of $0.49 in tobacco producing states, and $1.80 in non-tobacco producing states.

Federal:

- $1.01 per pack

Local:

- NYC ($1.50), Cook County ($3.00), Chicago ($1.18), Anchorage ($2.39)

Federal Alcohol Taxes

Beer

- $18 per 31 gallon barrel, or about $0.05 per 12-ounce can.

Wine

- $0.21 per 750 ml bottle for 14% alcohol or less.
- $0.31 per 750 ml bottle for 14-21% alcohol.
- $ 0.62 for 750 ml bottle for 21-24% alcohol.

Liquor

- $13.50 per 100 proof gallon (50% alcohol), or $2.14 per 750 ml bottle of 80 proof liquor.

State Alcohol Taxes

Beer

- High: TN ($1.29 per gallon), AK ($1.07 per gallon), AL ($1.05 per gallon)
- Low: WY ($0.02 per gallon), WI ($0.06 per gallon), MO ($0.06 per gallon)

Wine

- High: AK ($2.50 per gallon), FL ($2.25 per gallon), AL ($1.70 per gallon)
- Low: LA ($0.11 per gallon), CA ($0.20 per gallon), WI ($0.25 per gallon)

Liquor

- High: WA ($35.22 per gallon), OR ($22.72 per gallon), VA ($19.18 per gallon)
- Low: WV ($1.89 per gallon), MO ($2.00 per gallon), CO ($2.28 per gallon)

Do Taxes Reduce Consumption?

According to the law of demand they should:

- Ceteris paribus (all else equal), as the price of a good or service increases, consumer demand for the good or service will decrease.
- Economists generally believe that the law of demand is universal for all goods.
- Scholars within medical and psychological communities believe that certain goods are not subject to these laws.
- Some believe that due to addiction, the law of demand need not hold for things like cigarettes and beer.

Do Taxes Reduce Consumption?

- Starting in the 1970s, several authors began to study the question relating taxes and consumption of cigarettes.
- The identification strategy used in these papers is quite simple.
- Prices of cigarettes change frequently due to state and federal tax increases.
- There is variation in tax increases across states and across time.
- In general, states with changes to tax policy make up the treatment group, while those without any changes comprise the control group.

Do Taxes Reduce Consumption?

There is near universal agreement within the literature.

- A 10% increase in price reduces demand by 4%.
- Effects are found both along the extensive and intensive margins.
- Extensive margin -a reduction in the number of smokers.
- Intensive margin -a reduction in the number of cigarettes smoked per day among remaining smokers.

Results have been replicated for a number of different countries, time periods, variety of statistical models, and subgroups of the population.

Also, studies have been conducted for other addictive goods: alcohol, cocaine, marijuana, heroin, gambling.

Master Settlement Agreement (MSA)

The Tobacco Master Settlement Agreement:

- Was an agreement entered in November 1998 between the four largest tobacco companies and the attorney generals among each state.
- In the mid-1990s, states began to sue the major tobacco companies seeking monetary relief under various consumer-protection and antitrust laws.
- The MSA was an agreement that awarded over $206 billion to the states over a period of 25 years.
- The MSA also required the tobacco companies to better disseminate information regarding the dangers of smoking to consumers and to restrict their advertising, particularly anything targeted at youth.

Master Settlement Agreement (MSA)

Taxes are now a huge component to any anti-smoking campaign, and they became far more common after the MSA.

From a surgeon general's report:

- "raising tobacco excise taxes is widely regarded as one of the most effective tobacco prevention and control strategies"

After the MSA, tax hikes started to occur in several states, but not in others. This created the grounds for a natural experiment to study effects from these hikes.

Tax Hikes

By the end of 1996:

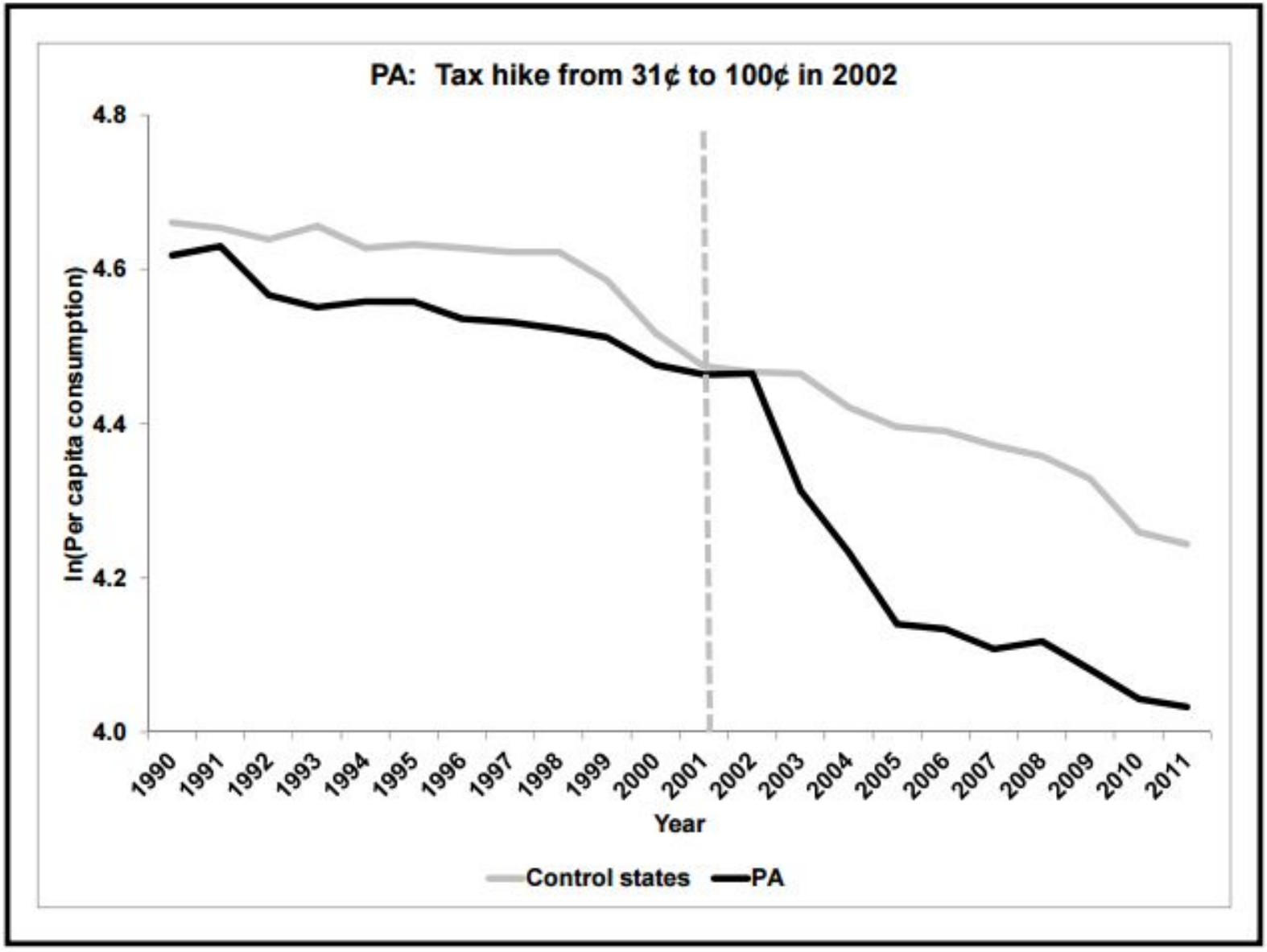
- There were 9 states with cigarette excise taxes of \$0.50 per pack.
- There were only 3 states with taxes in excess of \$0.75 per pack.

By the end of 2002:

- There were 24 states with cigarette excise taxes of \$0.50 or more per pack.
- There were 13 states with taxes in excess of \$1 per pack.

Today:

- There are 18 states with cigarette excise taxes in excess of \$2 per pack.
- There are 32 states with taxes higher than \$1 per pack.


PA: Tax hike from 31¢ to 100¢ in 2002
ln(Per capita consumption)
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4.6
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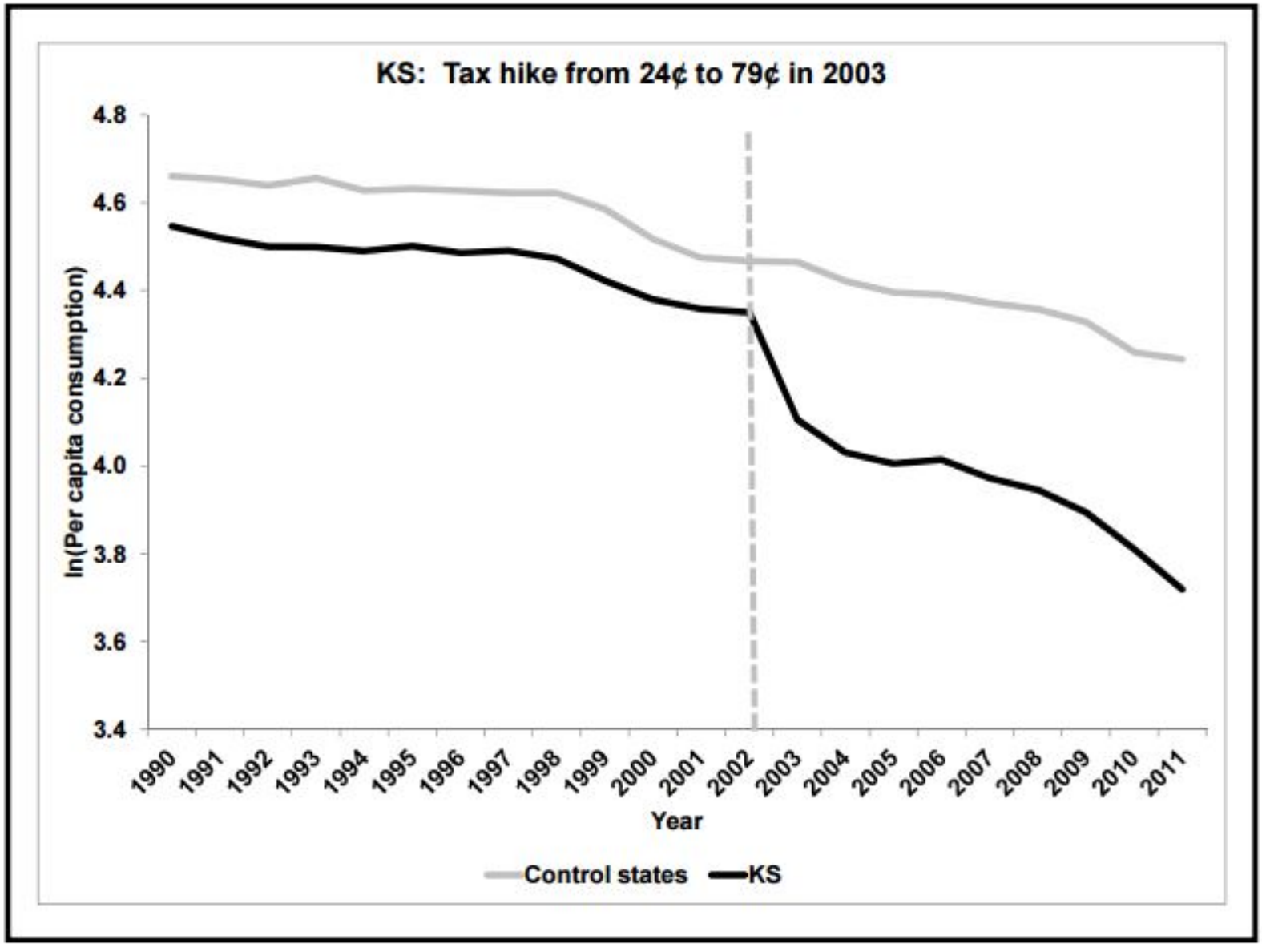
Control states
PA


KS: Tax hike from 24¢ to 79¢ in 2003
ln(Per capita consumption)
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4.6
4.4
4.2
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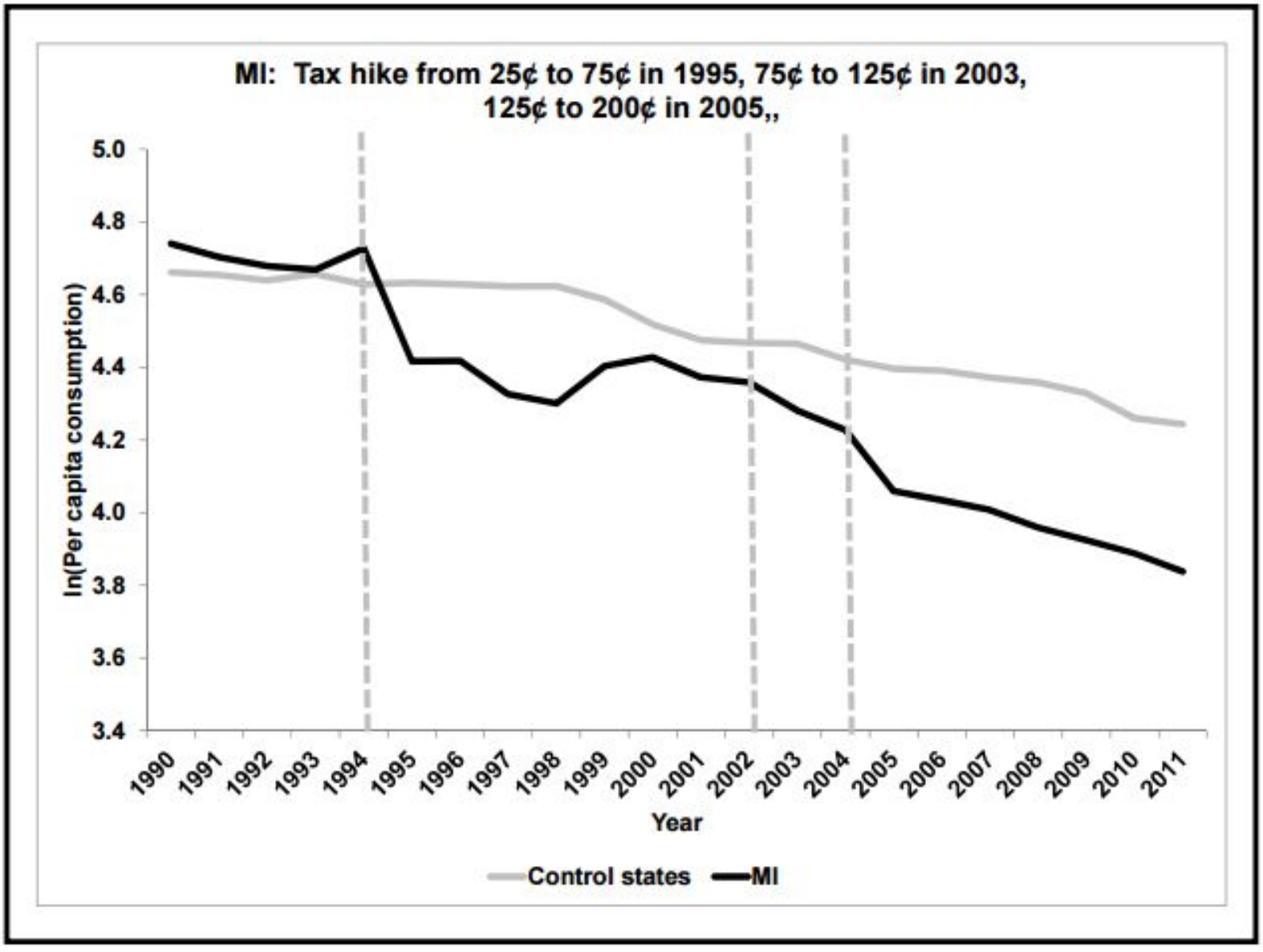
MI: Tax hike from 25¢ to 75¢ in 1995, 75¢ to 125¢ in 2003,
125¢ to 200¢ in 2005,,
ln(Per capita consumption)
5.0
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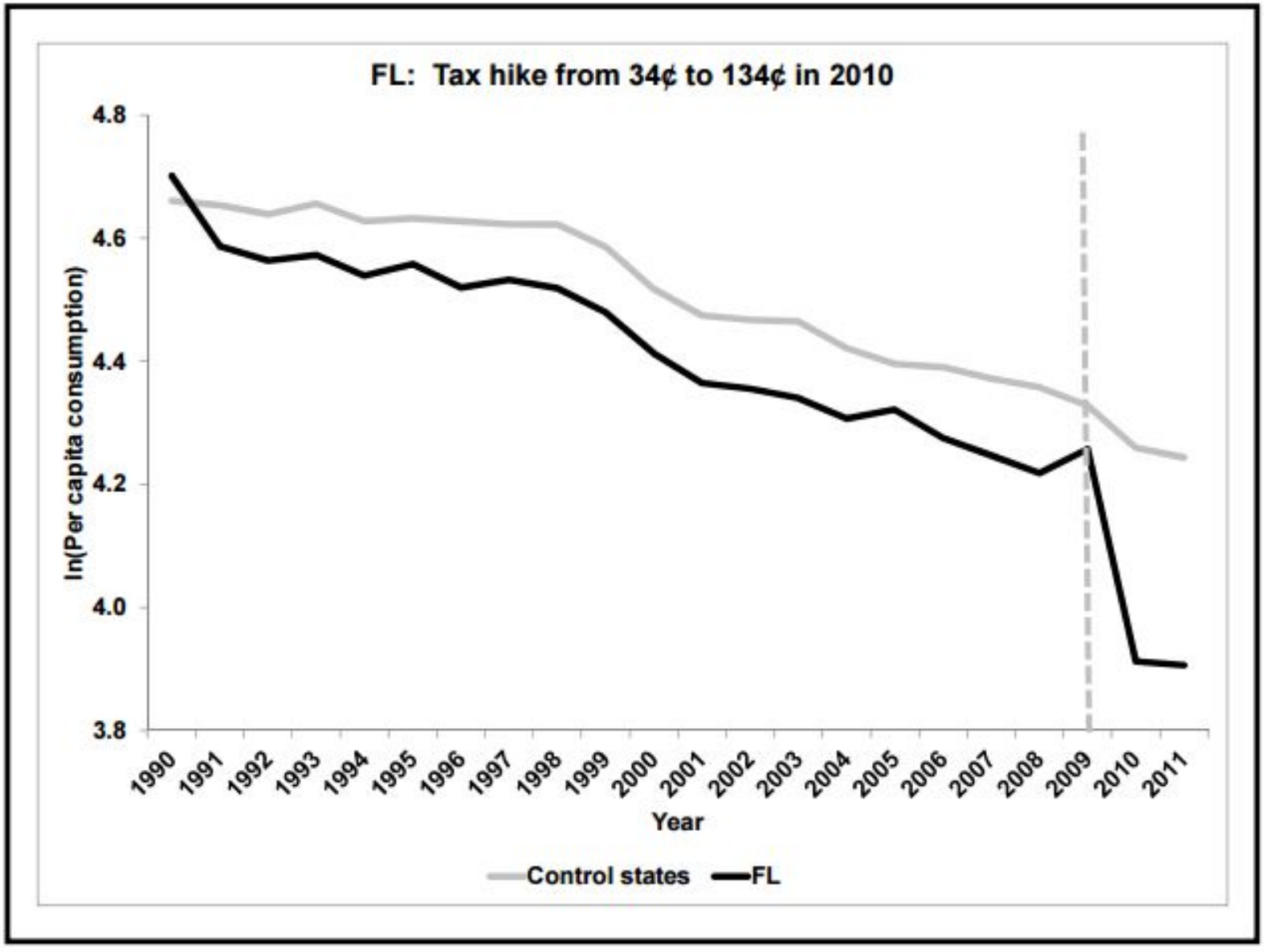
FL: Tax hike from 34¢ to 134¢ in 2010
ln(Per capita consumption)
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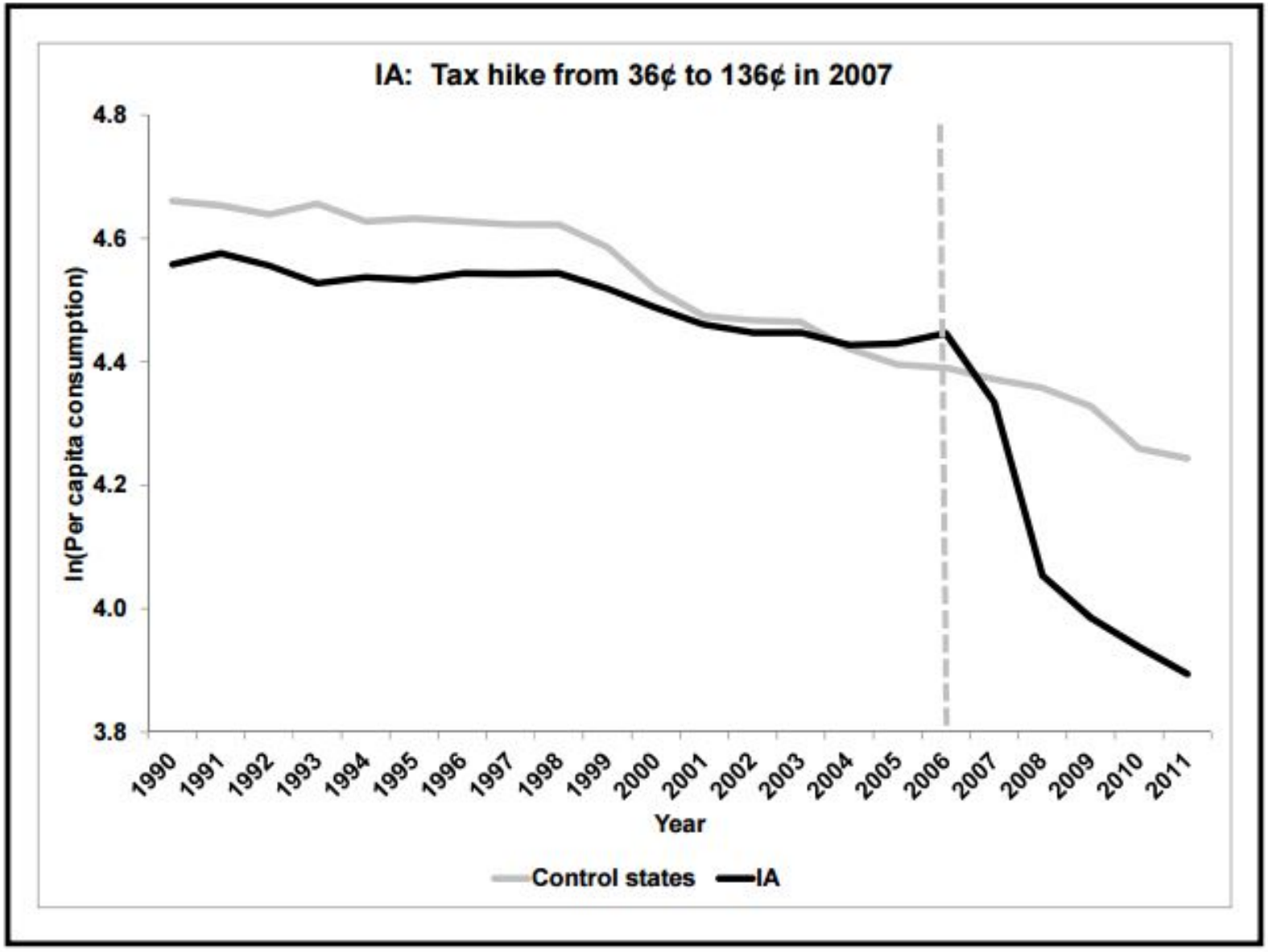
IA: Tax hike from 36¢ to 136¢ in 2007
ln(Per capita consumption)
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Control states
IA

External Costs of Poor Health

What are the external costs of alcohol and tobacco? Consider three classes of costs:

1. Direct Costs
2. Program Costs
3. Taxes on Earnings

Direct Costs

Direct costs of poor health due to alcohol and smoking are the obvious:

- Lives lost due to drunk driving.
- Fires caused by cigarettes.
- Indirect costs are things like secondhand smoke

Program Costs

Program costs of poor health due to alcohol and smoking are:

1. Health/life insurance costs
   - Costs of a smoker are paid collectively by those enrolled in an insurance program.
   - Externalities can be reduced if premiums are correlated with smoking.
2. Government Transfer Programs
   - Smoking and drinking increases the current costs in Medicare and Medicaid
   - It may, however, decrease costs in the future.

Taxes on Earnings

Costs due to taxes on earnings:

- Smokers and heavy drinkers are less productive during working years (not necessarily a causal mechanism).
- If smokers and heavy drinkers die prematurely, they pay less in state/local income taxes.

Social Programs

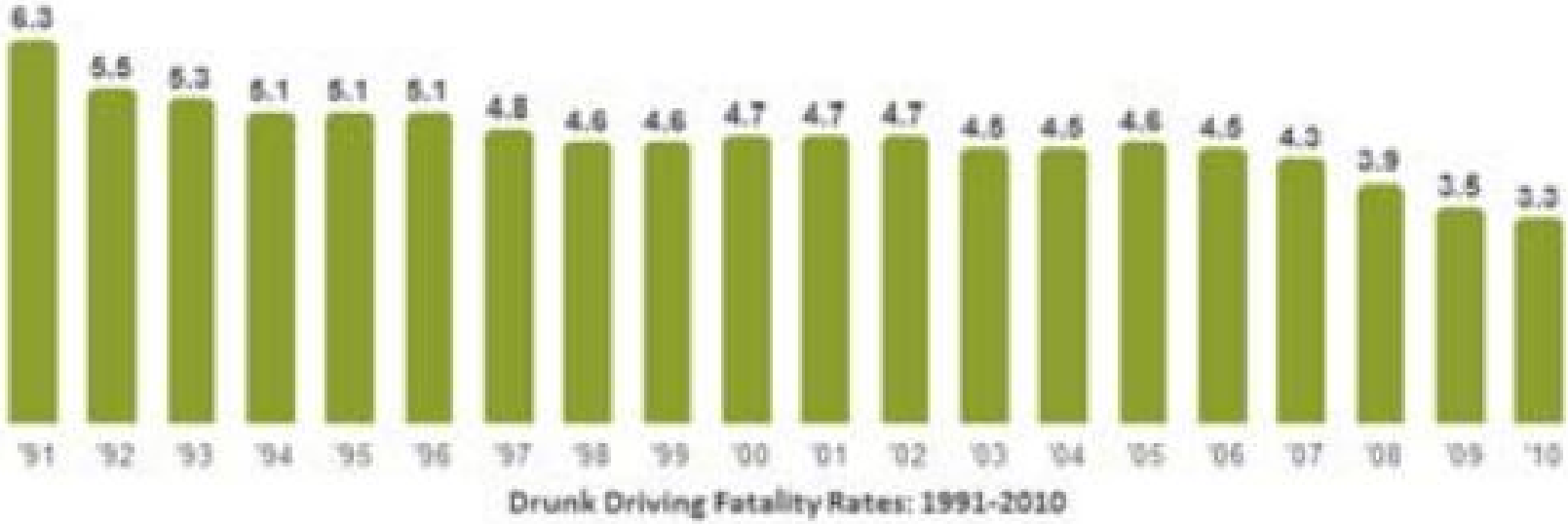
Special Case of Federal Programs:

- Expenditures in social programs are positively correlated with longevity (social security, Medicare, and Medicaid costs increase for older people).
- Because smoking kills people earlier in life, it prevents people from getting to the age in which medical expenditures are extremely high.
- From the perspective of other taxpayers, these are positive externalities of smoking and drinking.
- Smokers pay money to federal and state government programs, however they do not take as much out (social security, Medicare, and Medicaid) because they die early.

Cost-Benefit Analysis

- There is a strand of research analyzing the negative externalities imposed onto society through a cost-benefits lens. Sure, the negative externalities can be quite costly, but through taxation, we are able to reap some societal benefits from people smoking and drinking.
- If the benefits through taxation outweigh the negative societal costs, then smokers and drinkers may "pay their way."
- The literature largely estimates that smokers pay their way, while drinkers do not.
- The reason that drinkers do not pay their way is twofold. First, the large number of drunk driving deaths makes heavy drinking extra costly. Second, the real tax rate on alcohol has fallen across time.

Drunk driving fatalities per 100,000 population decreased 48% from 1991 to 2010.



Drunk Driving Fatality Rates: 1991-2010

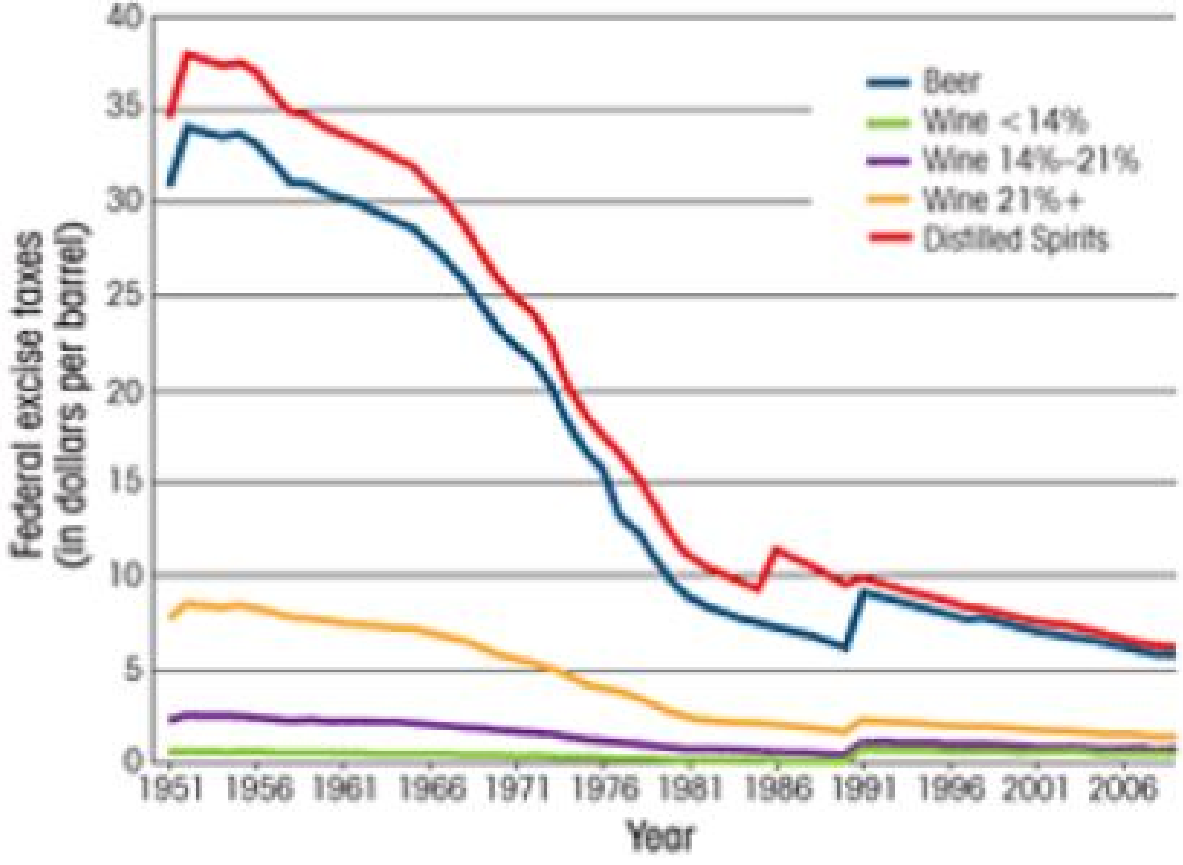


Figure 1 Average real Federal excise taxes (in dollars per barrel) on alcoholic beverages 1951–2009.

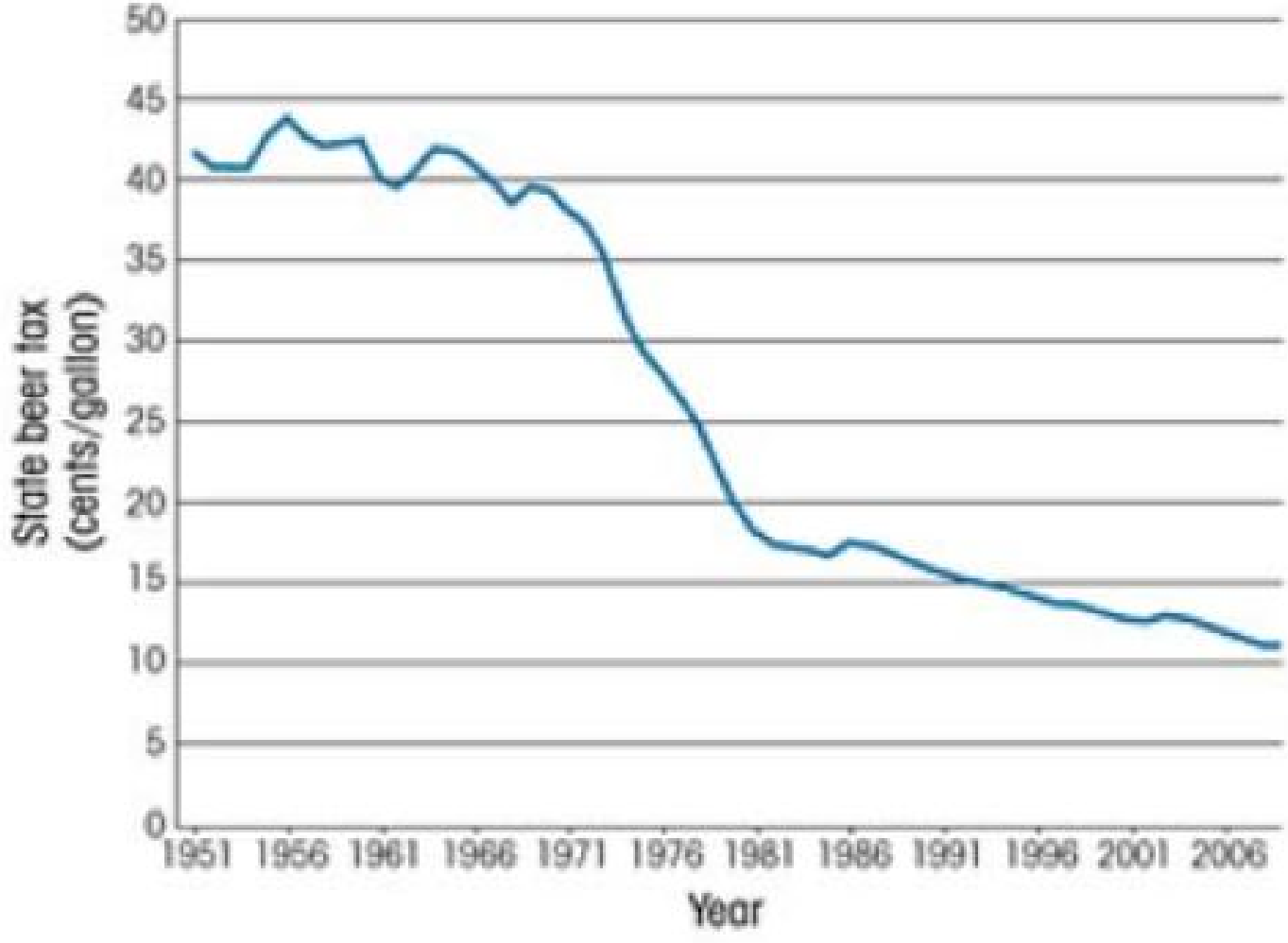


Figure 2 Average real State taxes on beer tax 1951–2009.

Summary

- Some goods such as alcohol and tobacco lead to negative externalities (they are actually bads).
- These bads create a social cost that we have to absorb as society.
- According to the CDC, a huge portion of deaths from the five leading causes of death are actually preventable through behavioral modification.
- There may be a role for the government to lessen this social cost, to promote individuals to lesson harmful, self-inflicting behavior, and it does this through taxation.
- The federal, state, and local governments levy taxes on alcohol and cigarettes in an effort to discourage their use. It has been widely shown that taxation of cigarettes leads to decreases smoking.

Next Class

The Pharmaceutical Industry (Chapter 17 FGS)