

The Economics of Tobacco and Tobacco Control

Frank J. Chaloupka

University of Illinois at Chicago



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Overview

- Background and related projects
- Economic rationale for government intervention
- Overview of the evidence on the impact of tax, price and tobacco control policies on tobacco use
- Myths and Facts about the “economic costs” of tobacco taxation and tobacco control

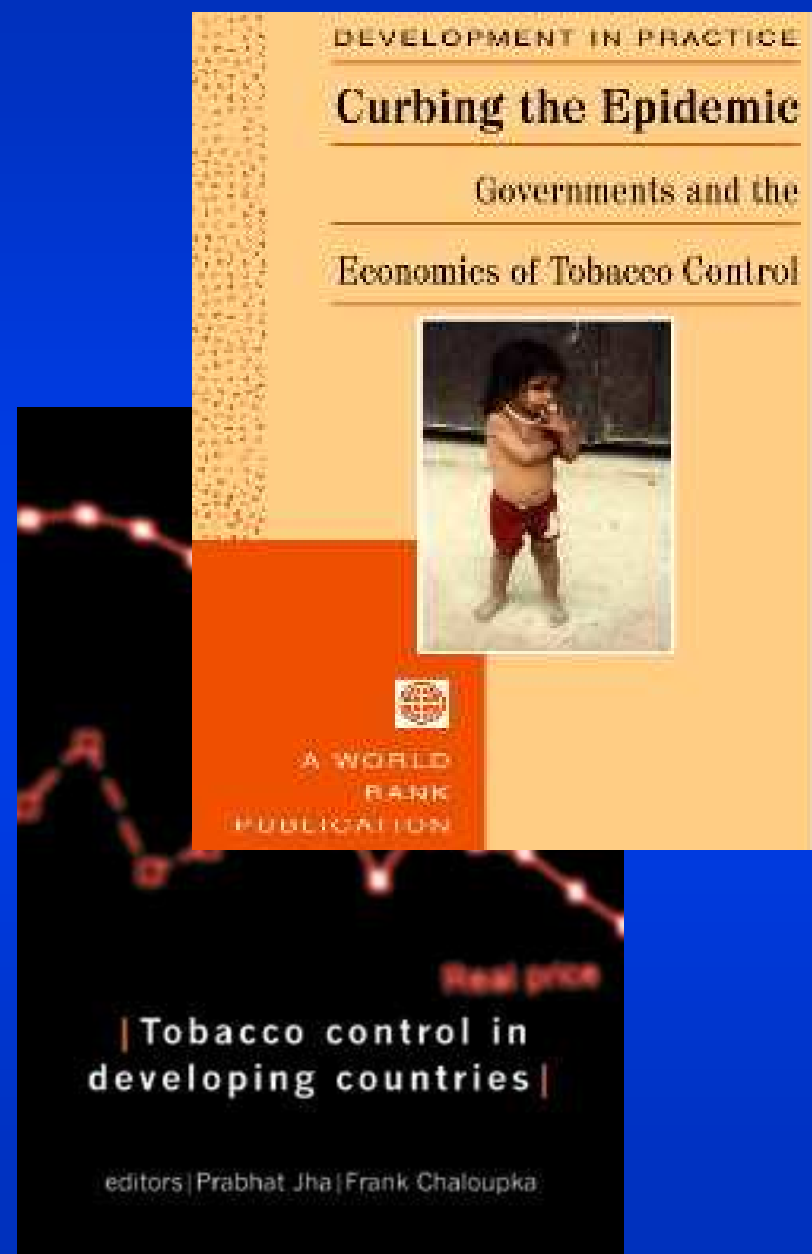
Prabhat Jha
University of Toronto
and
Frank Chaloupka
University of Illinois
at Chicago



The World Bank



WHO



International Tobacco Evidence Network

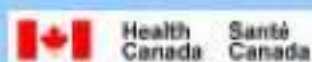
- ◆ Chaloupka and Jha, Co-Directors; Hana Ross Deputy Director
- ◆ Continues network developed for World Bank policy report
- ◆ Supported by WHO, CDC, Rockefeller Foundation and Open Society Institute
- ◆ Technical assistance, dissemination, small grant support
- ◆ Briefings for policy-makers
- ◆ Country reports on the economics of tobacco and tobacco control in 6 BGI countries
- ◆ www.tobaccoevidence.net

International Tobacco Control Policy Evaluation Project

<http://www.itcproject.org>



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NCI & WHO Monograph 21

Frank J. Chaloupka
Geoffrey T. Fong
Ayda Yurekli

*The Economics of
Tobacco Control*

Sept. 2009



National Cancer Institute
U.S. National Institutes of Health | www.cancer.gov



WHO



Why Economics?

Economic arguments around tobacco control are unclear and often debated

- In 1996, an Asian Health Minister stated “cigarette producers are making large contributions to our economy... we have to think about workers and tobacco farmers”
- In 1997, *The Economist* commented “most smokers (two-thirds or more) do not die of smoking-related disease. They gamble and win. Moreover, the years lost to smoking come from the end of life, when people are most likely to die of something else anyway”

Tobacco Use Rising Globally

- ◆ **1.1 billion adult smokers currently**
 - ◆ **projected to rise to 1.6 billion by 2025**
- ◆ **Cigarettes account for vast majority of tobacco use globally**
- ◆ **Use generally declining in high-income countries**
 - ◆ **More concentrated in lower income, less educated groups**
- ◆ **Use rising in many low/middle-income countries**
 - ◆ **particularly among women and children**

Large and growing number of deaths from smoking

Past and future tobacco deaths (in millions)

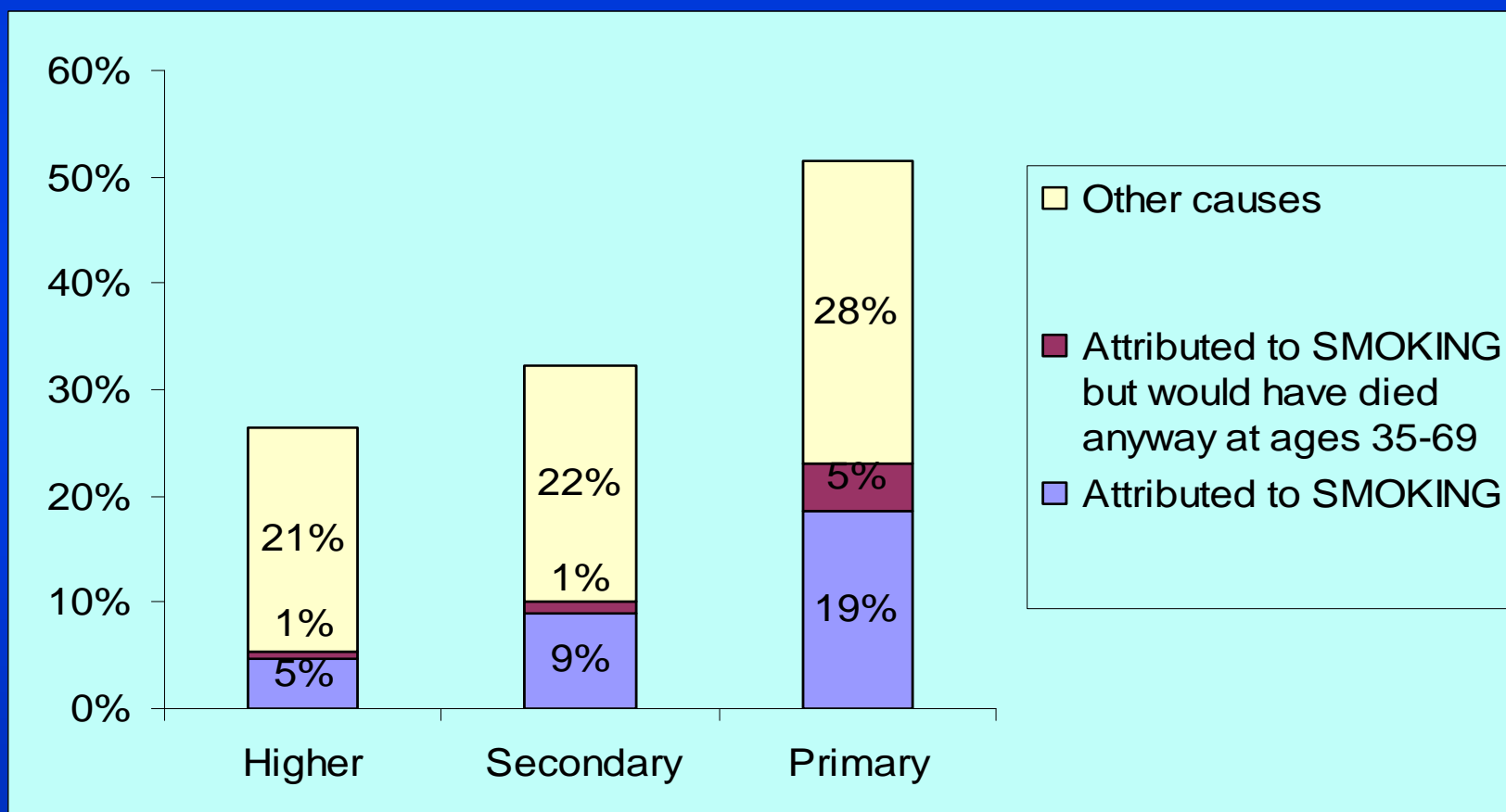
<u>Time</u>	<u>Millions of deaths</u>
1901-2000	100 (mostly in developed countries)
2001-2100	1,000 (mostly in developing countries)

- ◆ 500 M among people alive today
- ◆ 1 in 2 of long-term smokers killed by their addiction
- ◆ 1/2 of deaths in middle age (35-69)

Source: Peto and Lopez, 2000

Smoking accounts for much of the mortality gap between rich and poor

Risk of death of a 35 year old male before age 70, by education levels in Poland, 1996



Source: Bobak *et al.*, 2000

Why should governments intervene?

Economic rationale or “market failures”

- **Smokers do not know their risks**

Source: Jha *et al.*, 2000

Underestimated risks of smoking

- ◆ 7 in 10 of Chinese smokers thought smoking does them “little or no harm”
- ◆ Risks not internalized: personal risks perceived lower than average risks
- ◆ Risks of addiction downplayed: only 2 in 5 of US adolescents intending to quit actually do
 - ◆ in high-income countries, 7 in 10 smokers wish they had not started

Source: Kenkel and Chen, 2000; Weinstein, 1998; SGR, 1989 and 1994

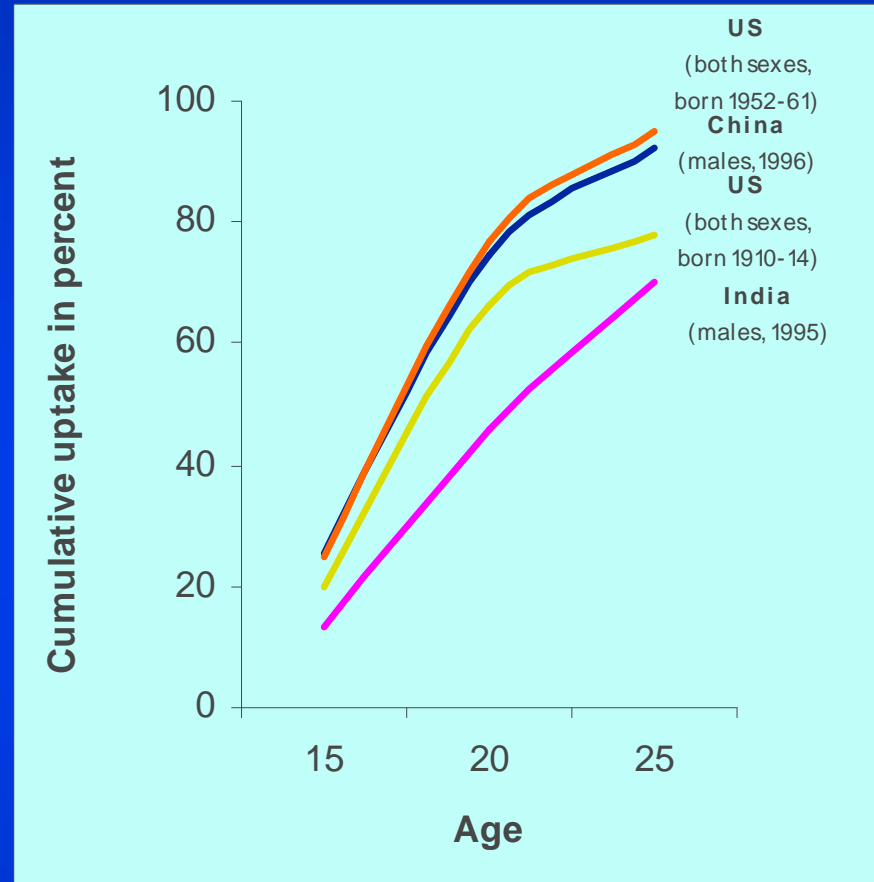
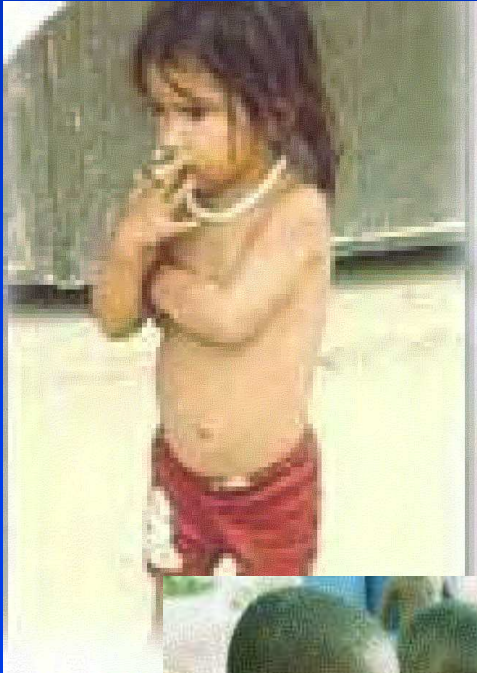
Why should governments intervene?

Economic rationale or “market failures”

- Smokers do not know their risks
- **Addiction and youth onset of smoking**
 - ◆ Lack of information and unwillingness to act on information
 - ◆ Regret starting later, but many addicted

Source: Jha *et al.*, 2000

Tobacco addiction starts early in life



- **Every day 80,000 to 100,000 youths become regular smokers**

Source: Chinese Academy of Preventive Medicine 1997, Gupta 1996, US Surgeon General Reports, 1989

Why should governments intervene?

Economic rationale or “market failures”

- Smokers do not know their risks
- Addiction and youth onset of smoking
 - ◆ Lack of information and unwillingness to act on information
 - ◆ Regret habit later, but many addicted
- **Costs imposed on others (externalities)**
 - ◆ **Costs of environmental tobacco smoke and health costs**

Source: Jha *et al.*, 2000

Healthcare costs from smoking

■ Annual (gross) healthcare costs:

- ◆ 0.1-1.1% of GDP, or 6 -15% of total health costs in high-income countries
- ◆ proportionally similar in lower-income countries

■ Net (lifetime) healthcare costs:

- ◆ Differences in lifetime costs are smaller than annual costs
- ◆ Best studies do suggest there are net lifetime costs
- ◆ Pension or “smokers pay their way” arguments are complex

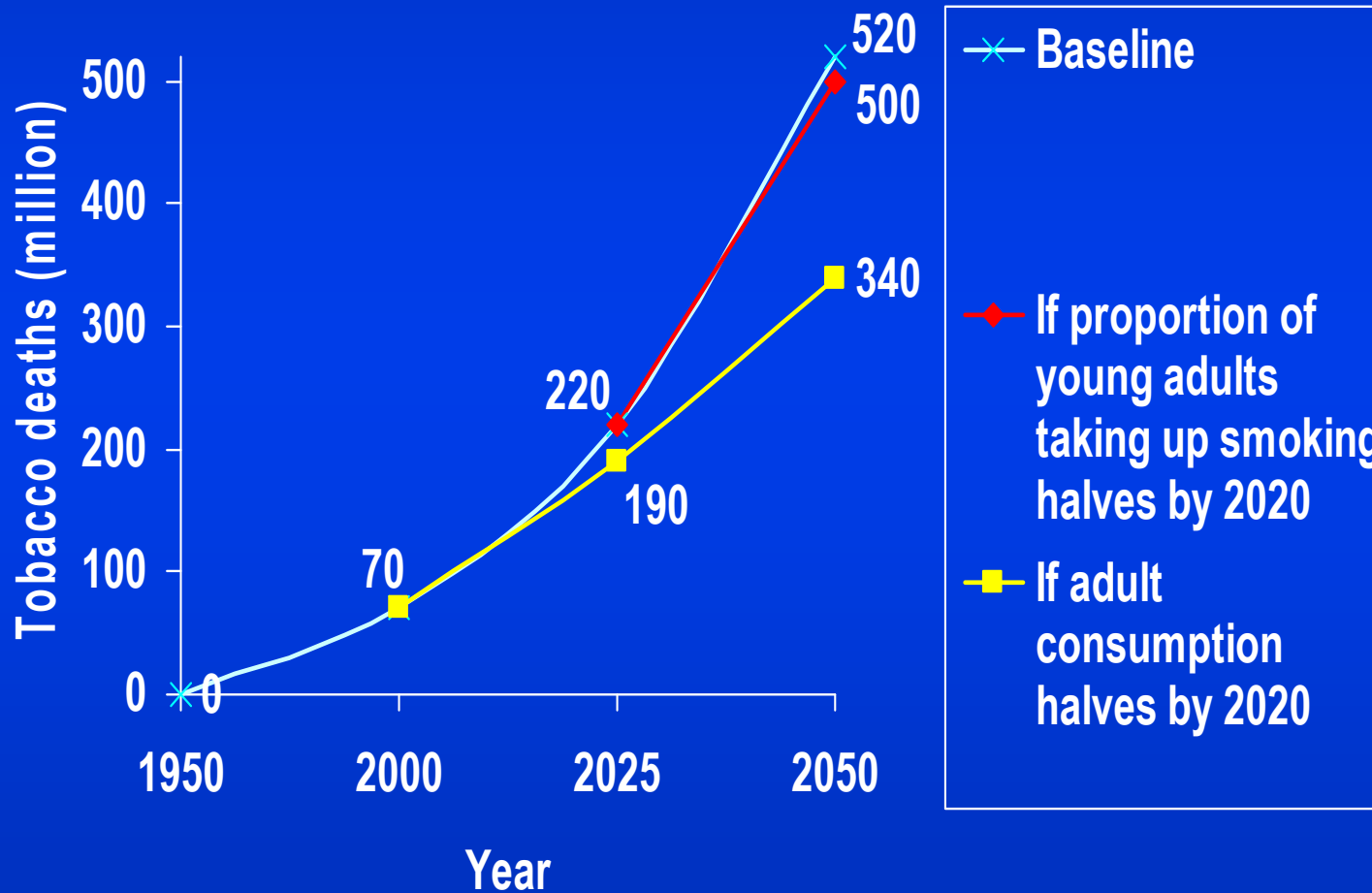
Source: Lightwood *et al.*, 2000

Government roles in intervening

- To deter children from smoking
- To protect non-smokers from others' smoke
- To provide adults with necessary information to make an informed choice
- ◆ *First-best instrument, such as youth restrictions, are usually ineffective. Thus, tax increases are justified, and are effective.*
- ◆ *Tax increases are blunt instruments.*

Source: Jha *et al.*, 2000

Unless current smokers quit, smoking deaths will rise dramatically over the next 50 years



Source: Peto and Lopez, 2001

Which interventions are effective?

Measures to reduce demand

- **Higher cigarette taxes**
- **Non-price measures:**
 - ◆ consumer information, research, cigarette advertising and promotion bans, warning labels and restrictions on public smoking
- **Increased access to nicotine replacement (NRT) and other cessation therapies**

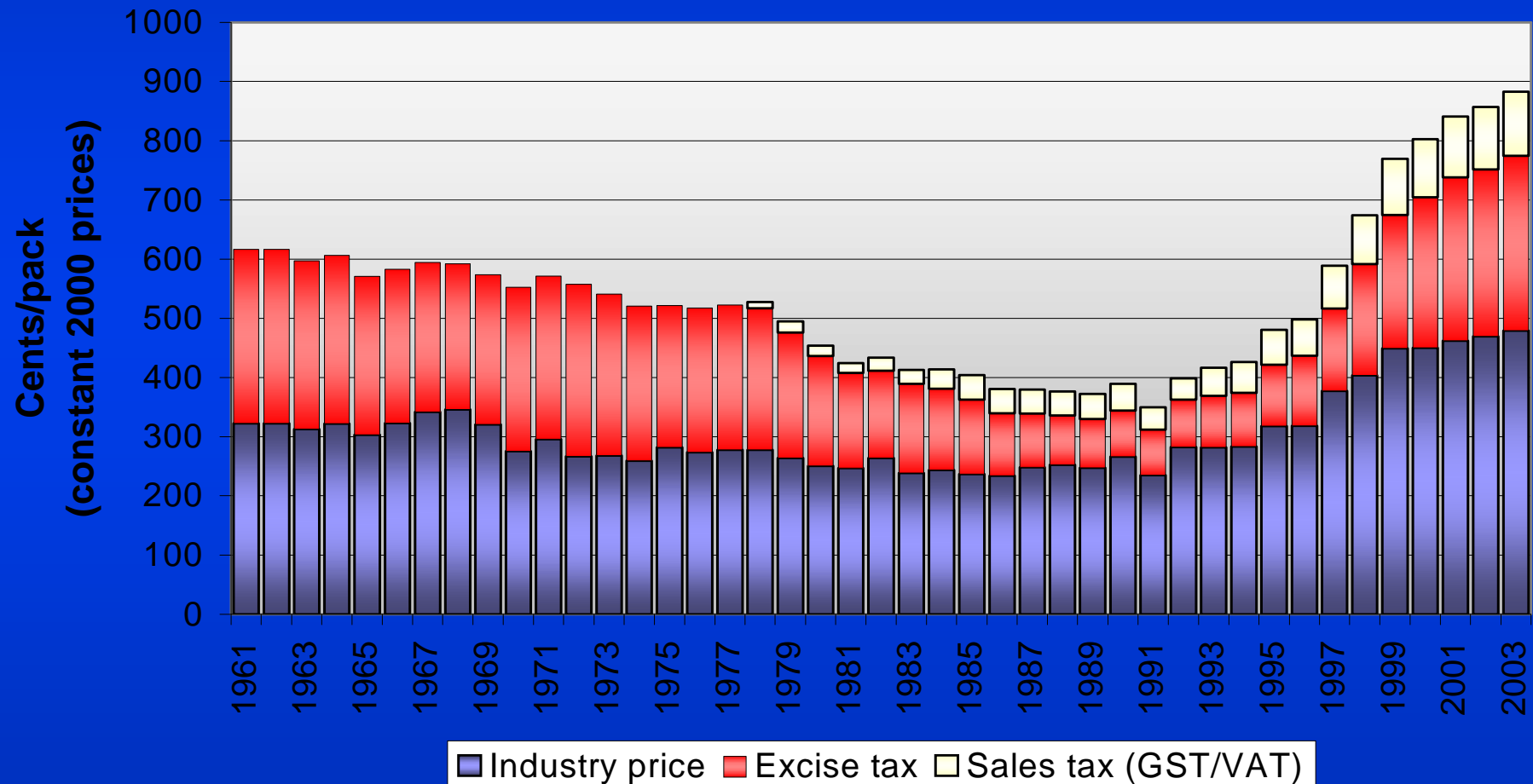
Why Tax Tobacco?

- **To generate revenues**
 - ◆ primary reason historically
- **To improve public health by reducing tobacco use**
 - ◆ increasingly common goal
- **To cover the external costs of tobacco use**
 - ◆ infrequently used argument

Source: Chaloupka *et al.*, 2000

Taxes and Tobacco Product Prices

Inflation Adjusted Cigarette Taxes and Prices
South Africa, 1961-2003

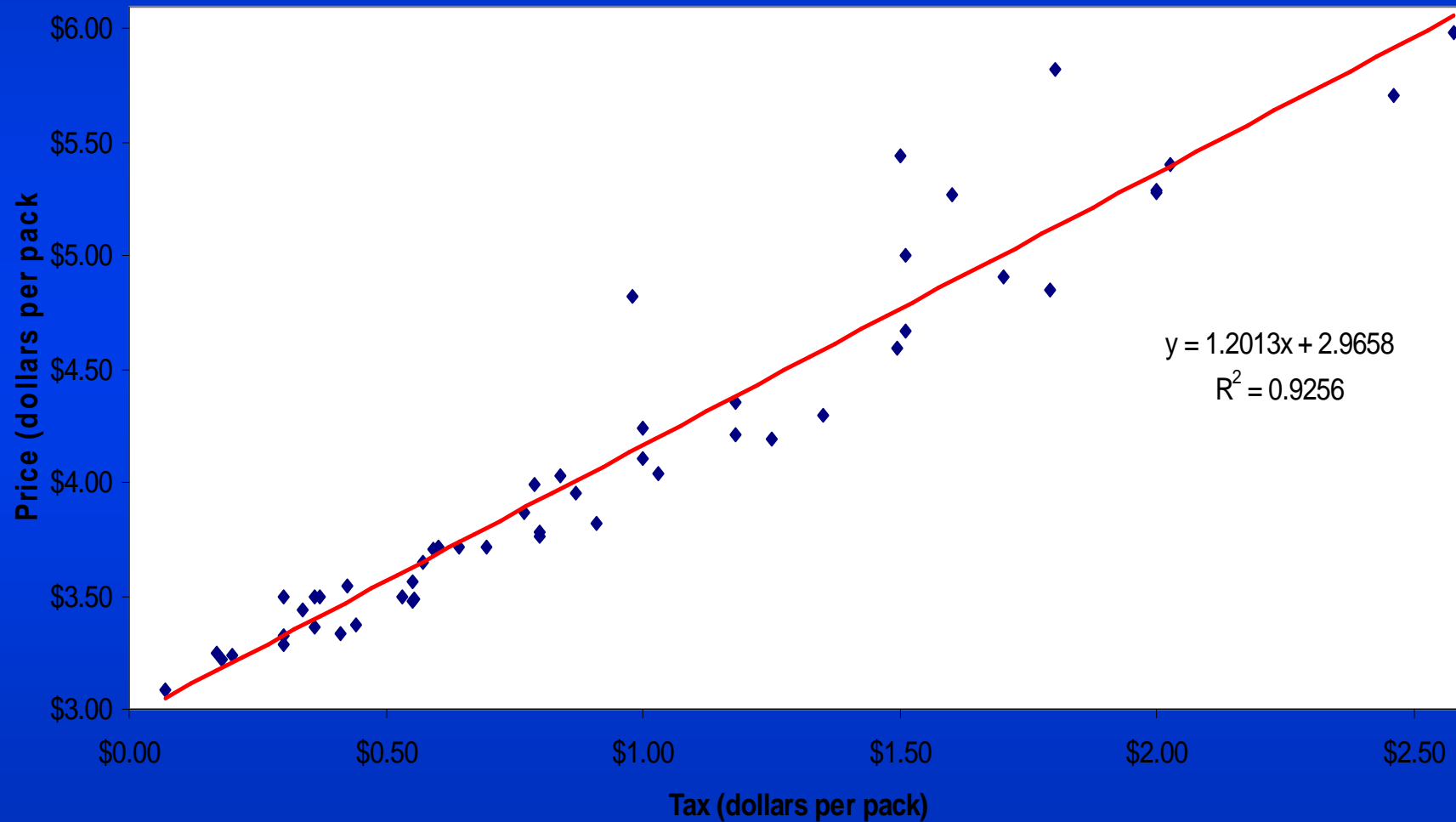


Source: Van Walbeek, 2003

Taxes and Tobacco Product Prices

State Cigarette Taxes and Prices,

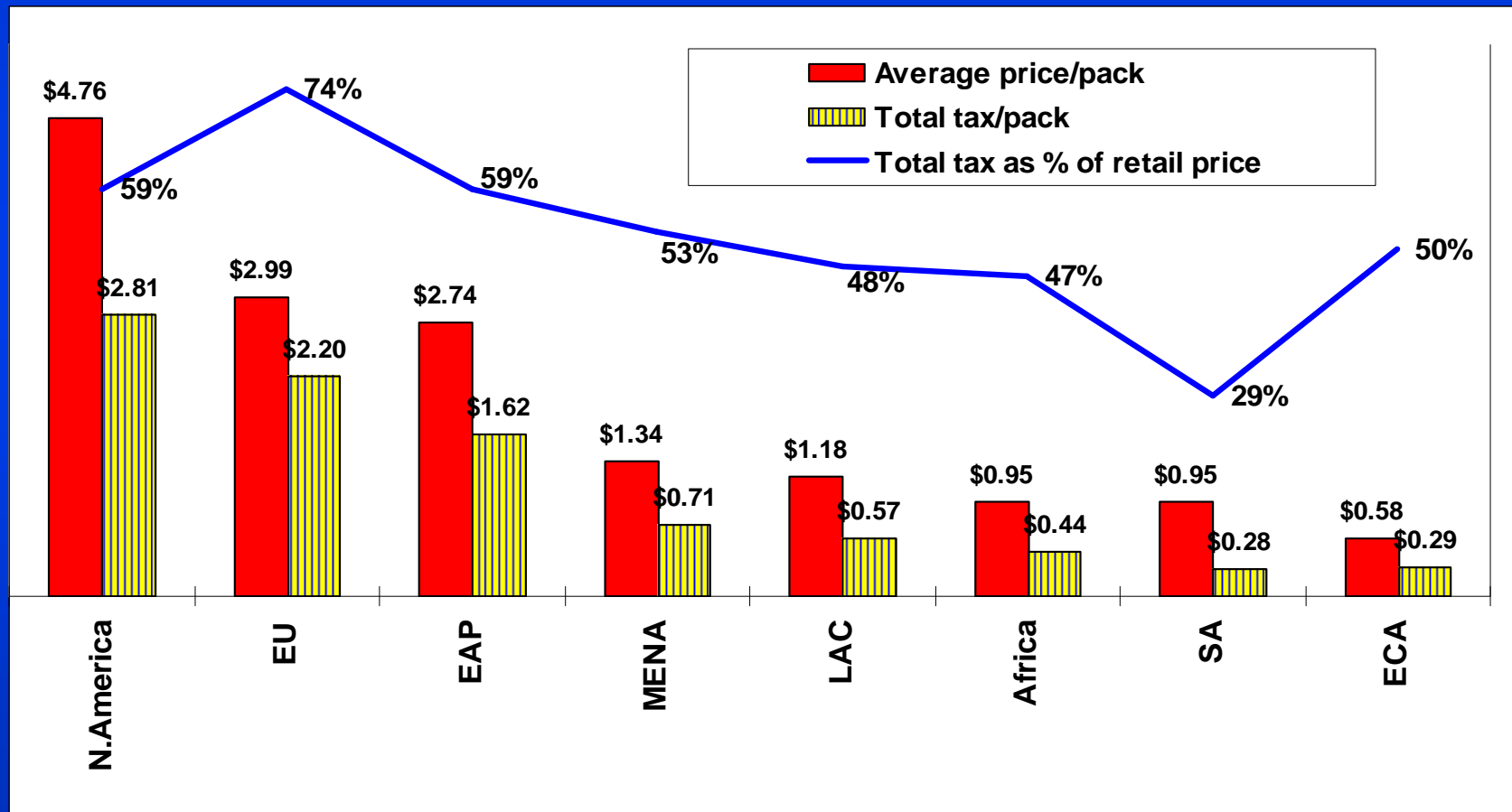
November 1, 2006



Taxes and Tobacco Product Prices

- Tax levels and, as a result prices, vary widely across countries

Price and Tax by Region, 2004-05



Source: Yurekli and Onder, 2006

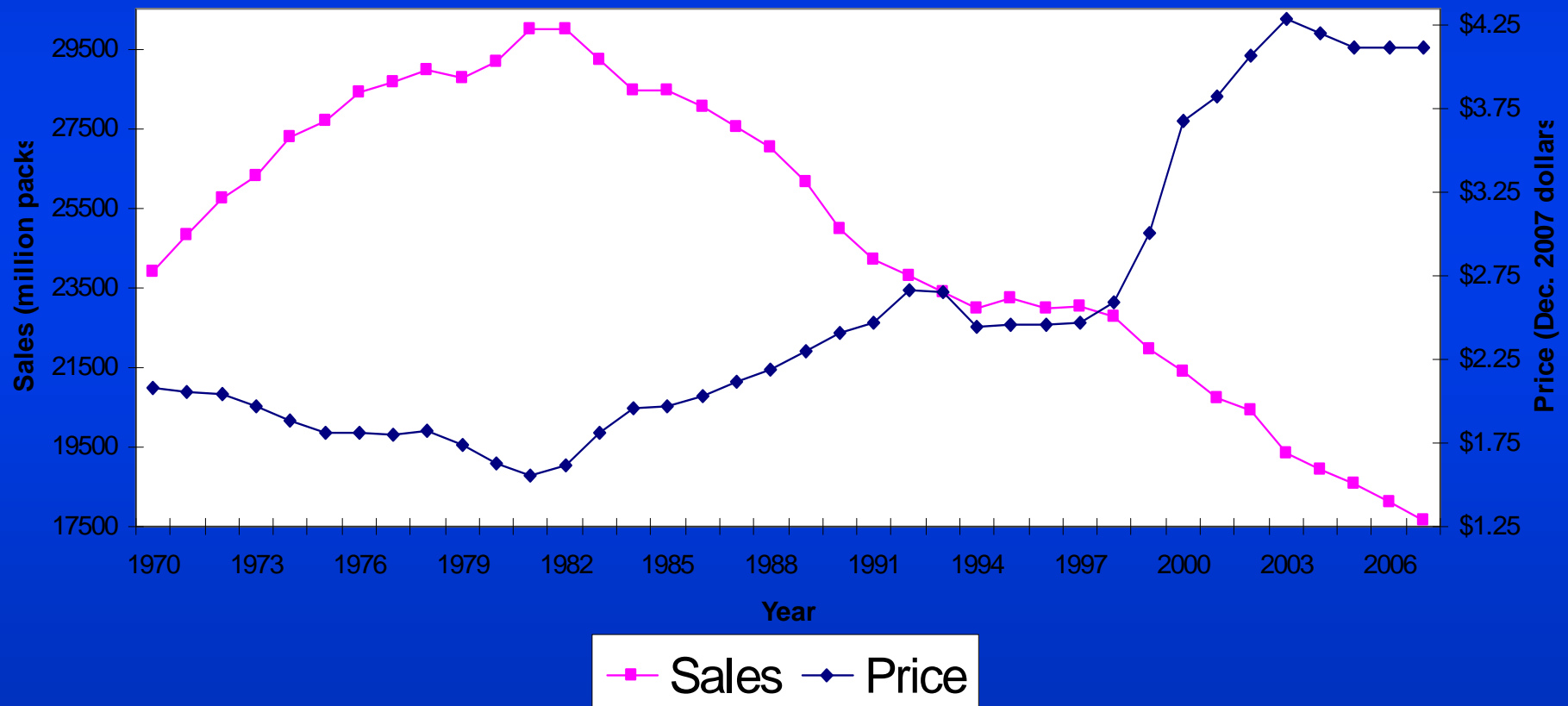
Impact of Tax and Price on Tobacco Use

- **Higher taxes and prices induce quitting, reduce consumption and prevent starting**
- **A 10% price increase reduces demand by:**
 - ◆ 4% in high-income countries
 - ◆ Up to 8% in low or middle-income countries
- **Potential substitution among tobacco products in response to changes in relative prices**
 - ◆ Particularly important issue where non-manufactured tobacco products widely available

Source: Chaloupka *et al.*, 2000

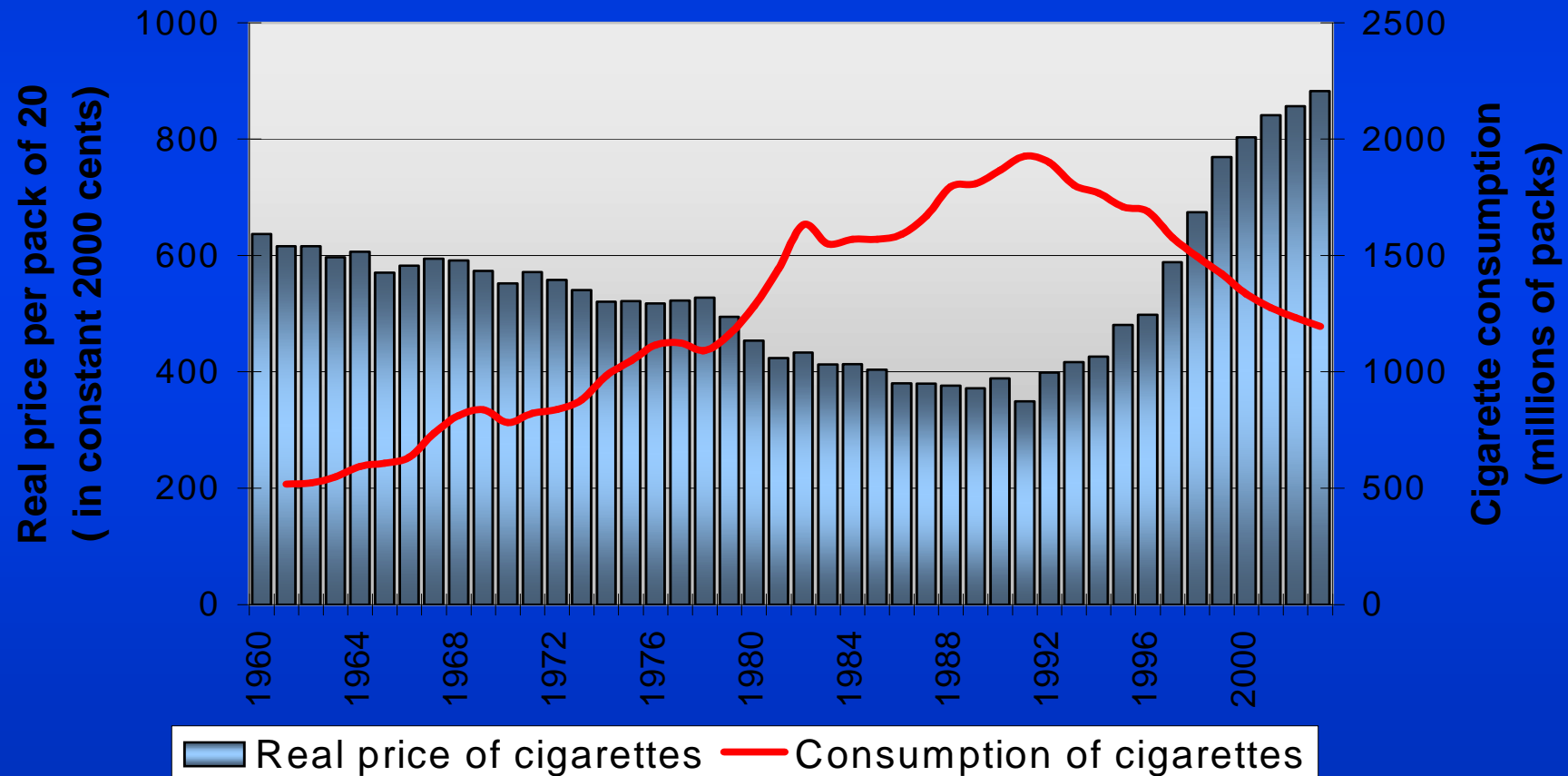
Cigarette price and consumption show opposite trends

Cigarette Prices and Cigarette Sales United States, 1970-2007



Cigarette price and consumption show opposite trends

Real price of cigarettes and annual per adult cigarette consumption in South Africa 1960-2002



Source: van Walbeek, 2003

Impact of Tobacco Taxation

- **Impact on prevalence about half of impact on overall cigarette consumption**
 - ◆ A 10% price increase reduces prevalence by about 2% in high-income countries
 - ☞ Likely larger in low/middle-income countries
 - ◆ **Most of impact on prevalence results from adult cessation**
 - ☞ 10% price increase increases quit attempts by 10-12%, about 1 in 5 successful in long run
 - ◆ **Addiction implies a larger long-run response to permanent price increases**
 - ☞ Estimates imply long run impact up to twice as large as short run impact

Sources: Chaloupka *et al.*, 2000; Tauras and Chaloupka, 2001; Tauras, 2004

Youth More Responsive to Price Increases

■ Economic Theory Suggests Several Reasons

- ◆ Greater importance of peer influences for youth
 - ☞ Accounts for about 1/3 of overall impact
- ◆ Low Incomes
- ◆ Shorter smoking histories imply less addicted
- ◆ More present-oriented than adults
- ◆ Other spillover effects
 - ☞ For example, through parental smoking

Sources: Chaloupka 2003; Powell and Chaloupka, 2005; Powell et al. 2005

Youth More Responsive to Price Increases

■ High Income Countries (largely US):

- ◆ Impact of price on youth smoking 2-3 times as large as on adult smoking
 - ☞ 10% increase in price reduces youth prevalence by 6-7%; comparable reductions in number of cigarettes consumed by continuing youth smokers
- ◆ Impact of price on youth smoking largely result of deterred initiation of regular smoking
 - ☞ 10% price increase reduces any initiation by 2-3%, but reduces initiation of daily smoking by 9-10%

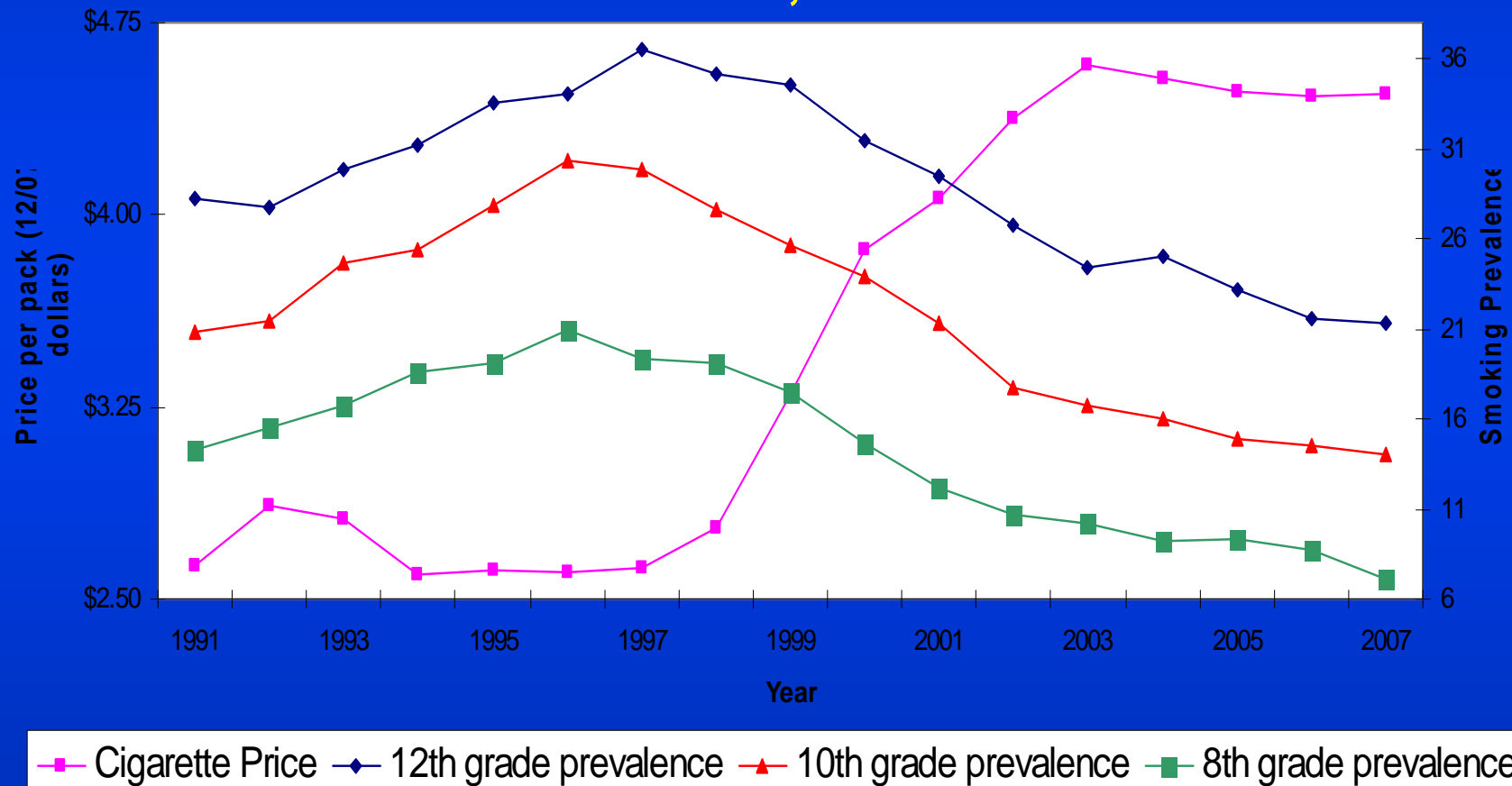
■ Similar evidence emerging from a number of low and middle-income countries

- ☞ 10% increase in price reduces initiation by 12% in Vietnam

Sources: Chaloupka, et al. 2000; Tauras et al. 2001; Ross and Chaloupka, 2006

Cigarette price and youth smoking

Cigarette Price and Youth Smoking Prevalence, United States, 1991-2007



Price Sensitivity and Income

- **Economic theory implies smoking among lower-income populations more responsive to price**
- **Consistent with empirical evidence from high income countries:**
 - ☞ UK: 10% price increase reduces smoking by about 10% in lowest socioeconomic group but has little impact on highest socioeconomic group
- **Similar evidence emerging from a number of low and middle-income countries**
 - ☞ Bulgaria – reductions in smoking among low/middle-income groups nearly three times greater than among high income group in response to price increase

Sources: Chaloupka, et al. 2000; Ross and Chaloupka, 2006

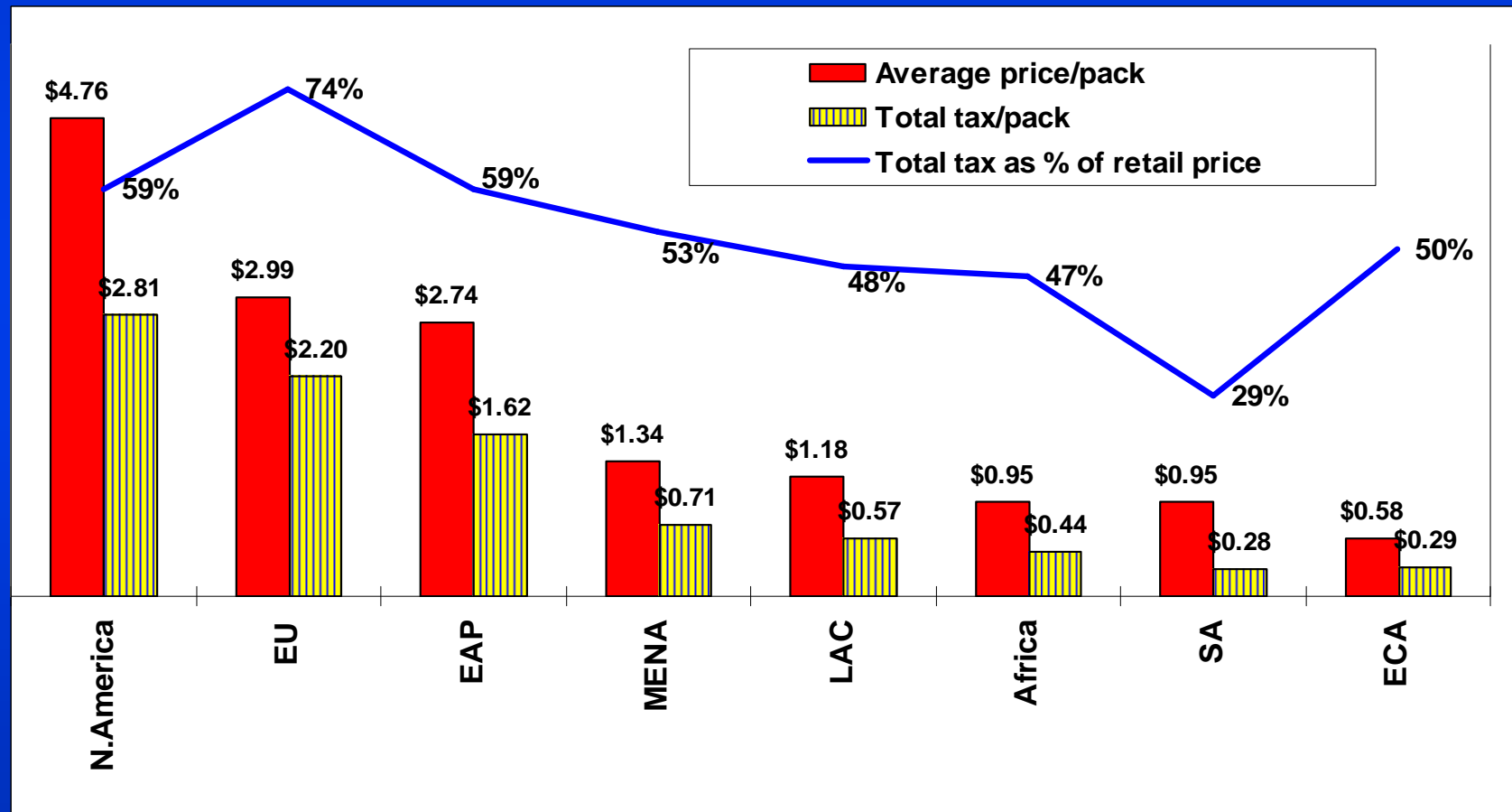
What is the “right” level of tax?

- **Complex question**
 - ◆ Depends on various factors, such as degree to which society wishes to protect children, revenue considerations, etc.
- **Useful yardstick: where comprehensive programs used, tax is at least 2/3 to 4/5 of retail price.**

Source: Jha and Chaloupka, 1999

There is still ample room, especially in lower-income countries, to raise cigarette taxes

Price and Tax by Region, 2004-05



Source: Yurekli and Onder, 2006

Non-price measures to reduce demand

- **Comprehensive ban on advertising and promotion**

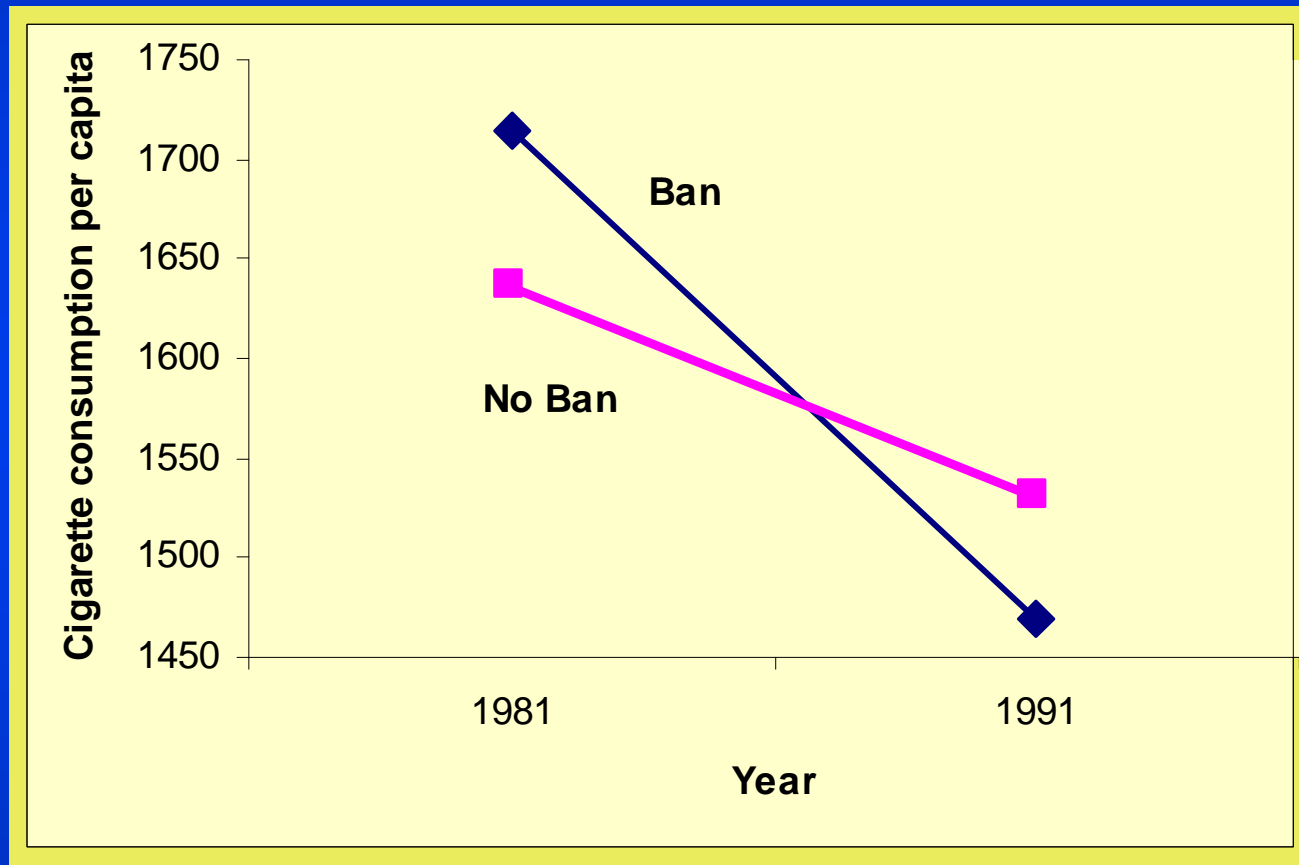
Effect of advertising and promotion bans

- High Income Countries:
 - ◆ Comprehensive ban on tobacco advertising and promotion reduces consumption by about 6%
 - ◆ Partial bans have little impact given potential to substitute to non-banned media

Source: Saffer and Chaloupka, 2000

Comprehensive advertising bans reduce cigarette consumption

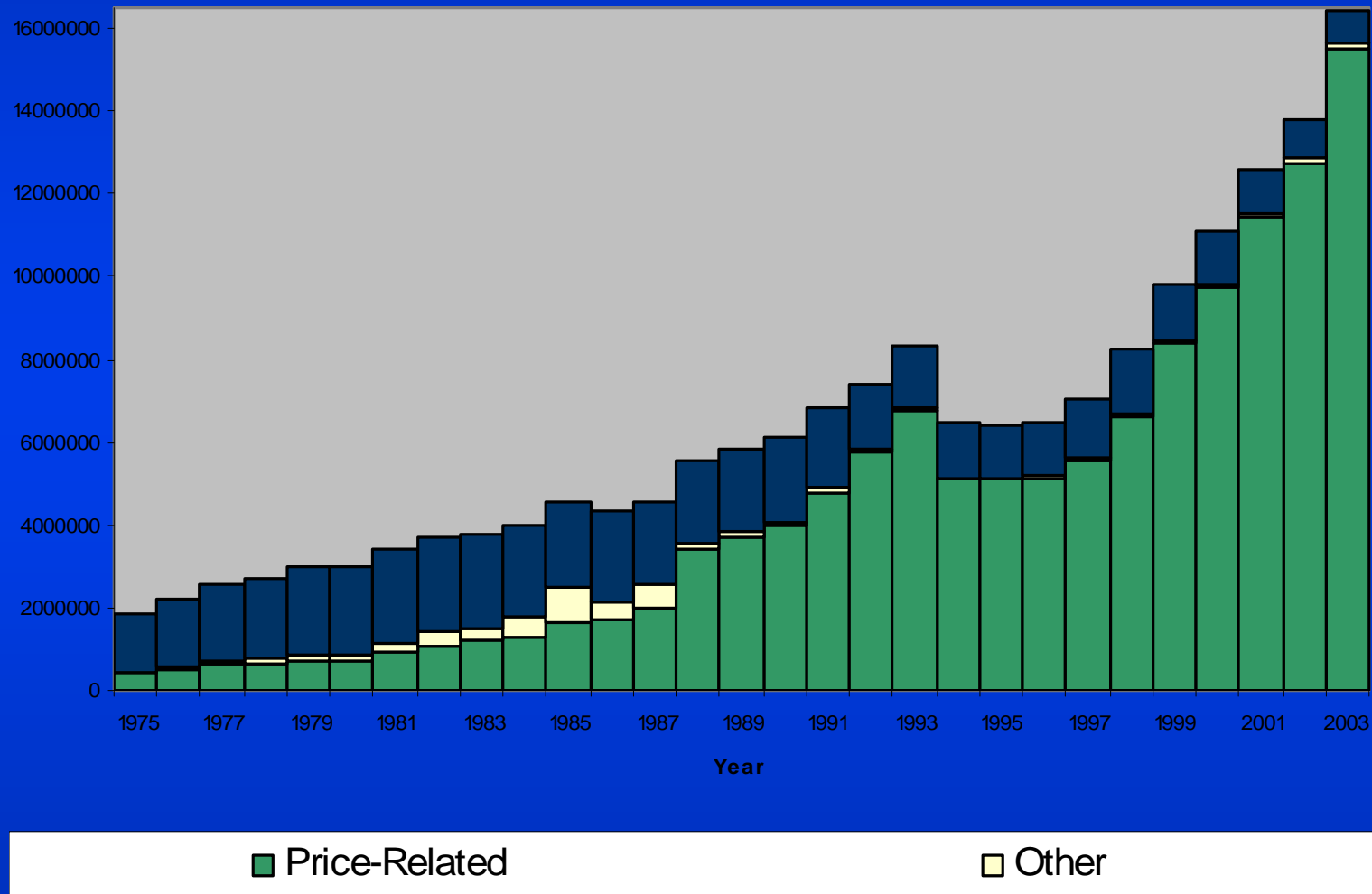
Consumption trends in countries with such bans vs. those with no bans (n=102 countries)



Source: Saffer, 2000

Partial bans induce increases in other marketing efforts

US cigarette marketing expenditures, 1975-2003



Source: Tauras, Peck and Chaloupka, 2007

Effect of advertising and promotion bans

- High Income Countries:
 - ◆ Comprehensive ban reduces consumption by about 6%
 - ◆ Partial bans have little impact
- **Low & Middle Income Countries:**
 - ◆ Larger reductions in tobacco use from comprehensive ban
 - ☞ nearly 25% drop in consumption
 - ◆ Partial bans have significant impact on consumption
 - ☞ Over 13% reduction

Source: Saffer and Chaloupka, 2000; Blecher, in press

Non-price measures to reduce demand

- Comprehensive ban on advertising and promotion
- Bans on smoking in public places and all work places

Smoke-Free Air Laws and Cigarette Smoking

■ Smoke-free air laws:

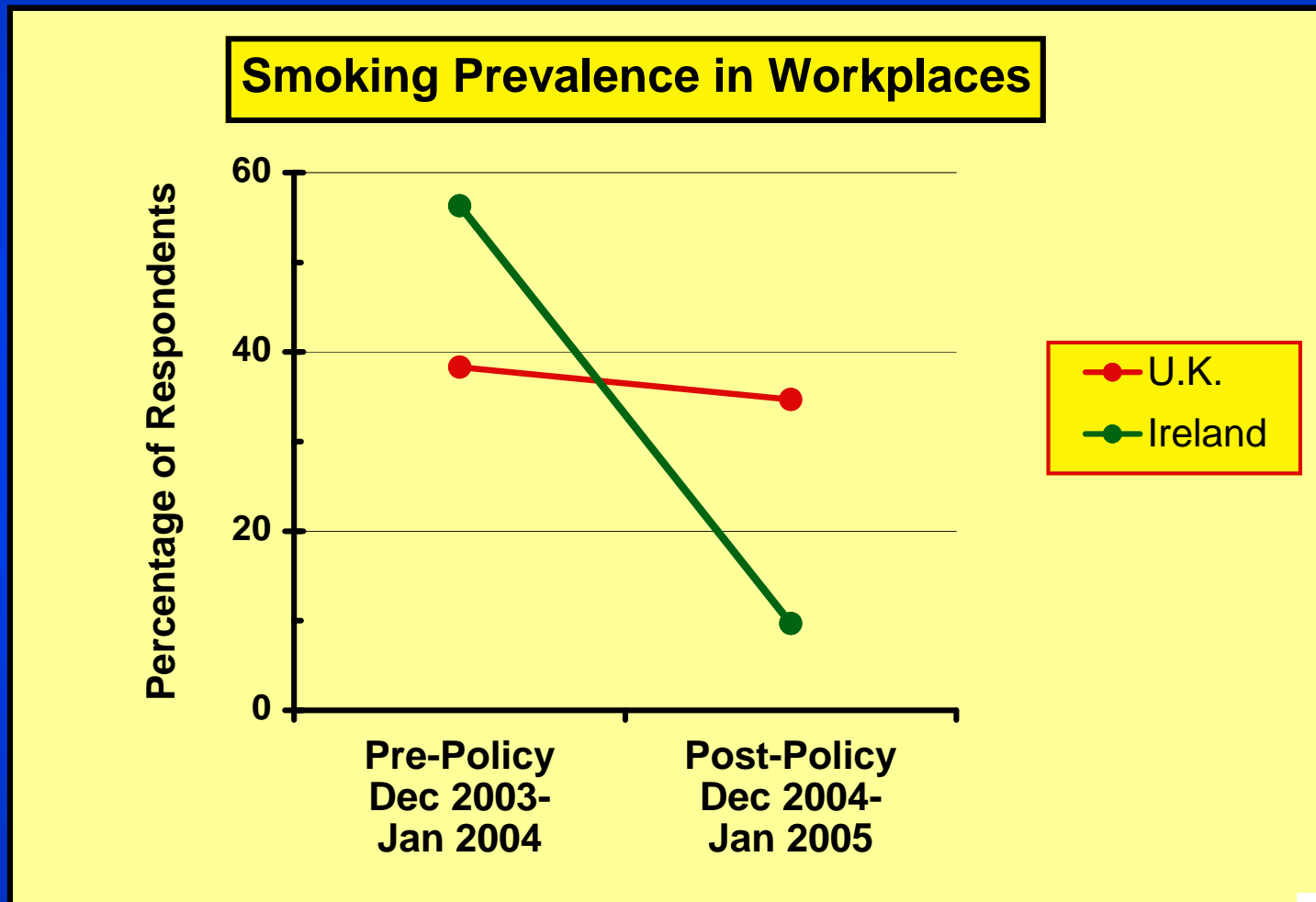
- ◆ reduce cigarette consumption and promote cessation
- ◆ protect non-smokers from exposure to harmful tobacco smoke
- ◆ can be self-enforcing
- ◆ work best with social consensus against smoking
- ◆ Can strengthen anti-smoking norms
- ◆ Do not have an adverse economic impact on businesses covered by the policies

Source: Woolery et al., 2000; IARC, in press

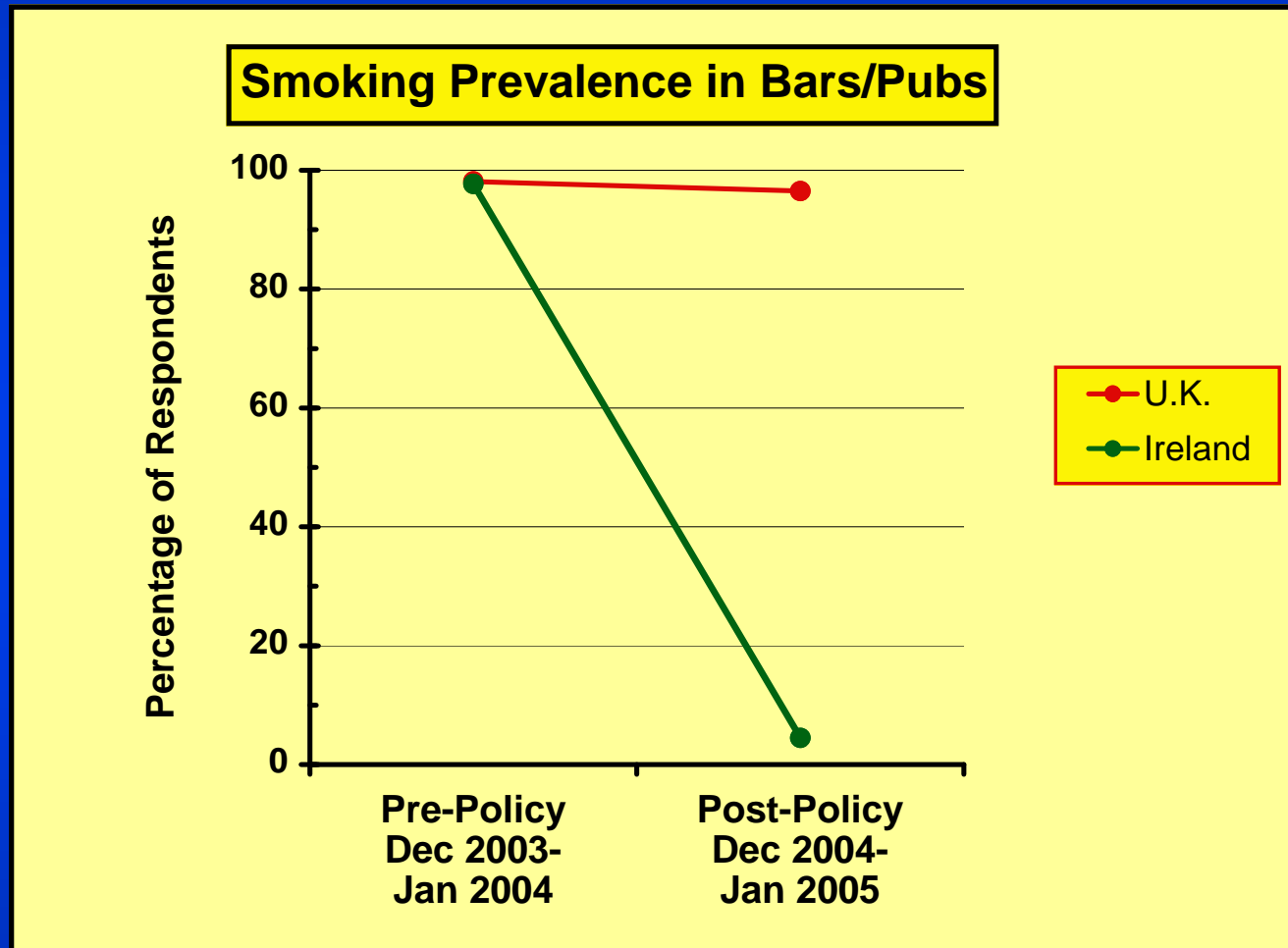
International Tobacco Control Policy Survey Expansion—Ireland Project

- ◆ Quasi-experimental design:
 - Ireland: 1,000 randomly selected adult smokers
 - U.K.: 600 randomly selected adult smokers
 - Cohort design:
 - Wave 1: Dec 2003–Jan 2004
 - Workplace Ban: Mar 29, 2004**
 - Wave 2: Dec 2004–Jan 2005
- ◆ Survey identical to 4-country survey; adds more extensive set of evaluation measures relating to smoke-free laws

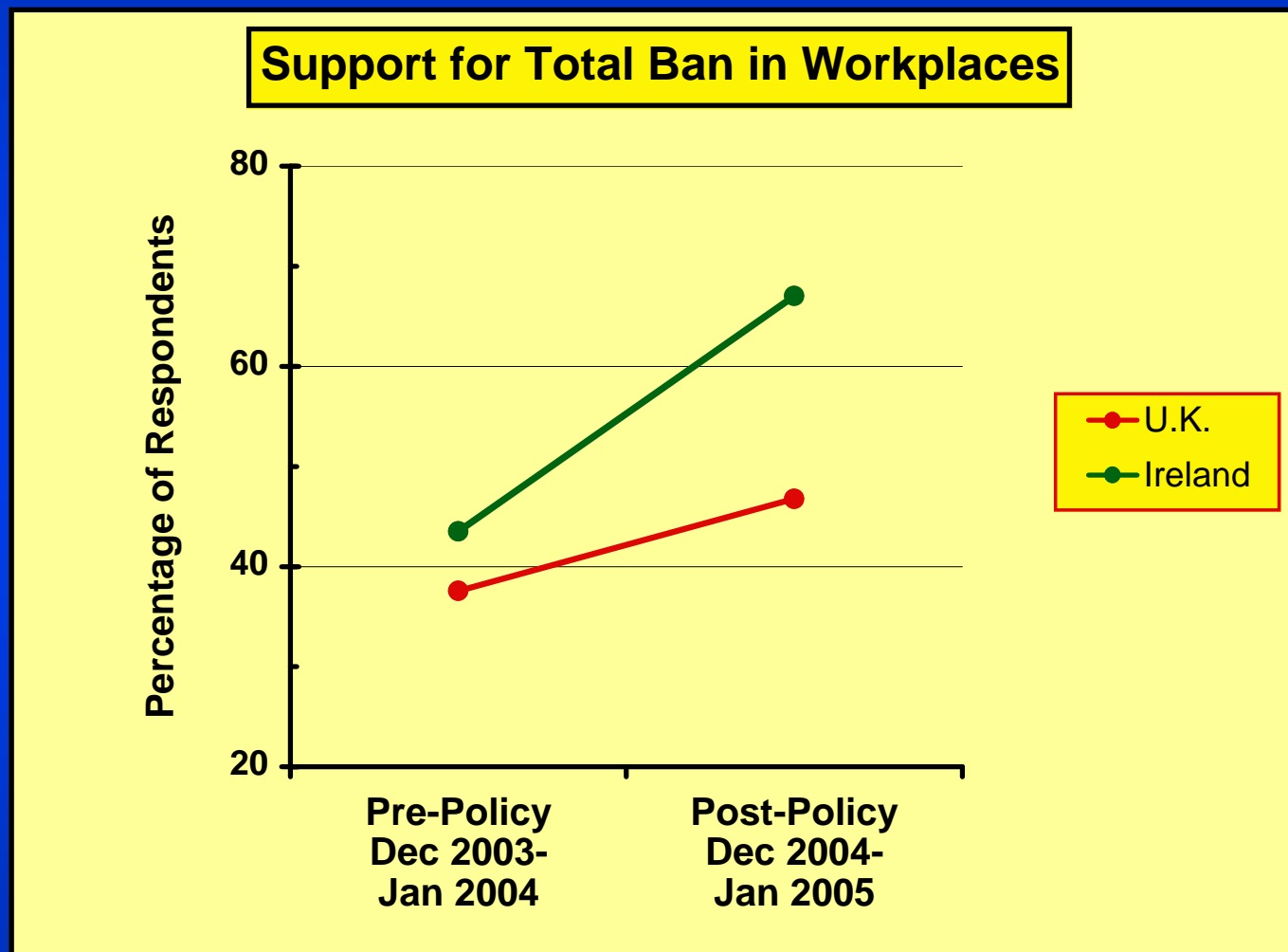
Prevalence of Smoking in Key Venues



Prevalence of Smoking in Key Venues



Support for Total Ban in Workplaces



Non-price measures to reduce demand

- Comprehensive ban on advertising and promotion
- Bans on smoking in public and work places
- **Increased consumer information:**
dissemination of research findings, warning labels, counter-advertising

Health information reduces the demand for cigarettes

Country	Time	Event	Immediate reduction in cigarette consumption
The US	1964	Surgeon General Report	1-2%
UK	1962	1 st report of the Royal College of Physicians	5%
Switzerland	1966	An anti-smoking campaign	11%
Turkey	1982	Implementation of health warning labels	8%

Source: Kenkel and Chen, 2000

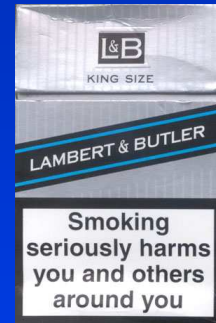
ITC Evaluation of UK Information-Related Policies (2003)

- ◆ Between Wave 1 and Wave 2, two information policies implemented in the U.K.:
 - **Jan 2003:** Enhancement of warning labels per EU Directive 2001/37/EC
 - **Sep 2003:** Ban on “light” “mild” and other descriptors per EU Directive 2001/37/EC
- ◆ Consistent with FCTC provisions

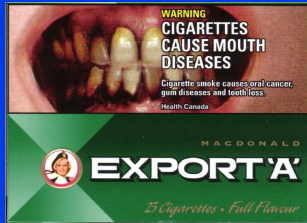
October 2002

May 2003

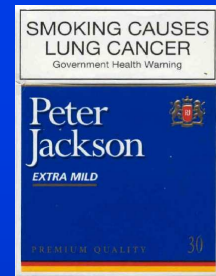
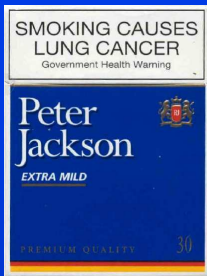
U.K.



Canada



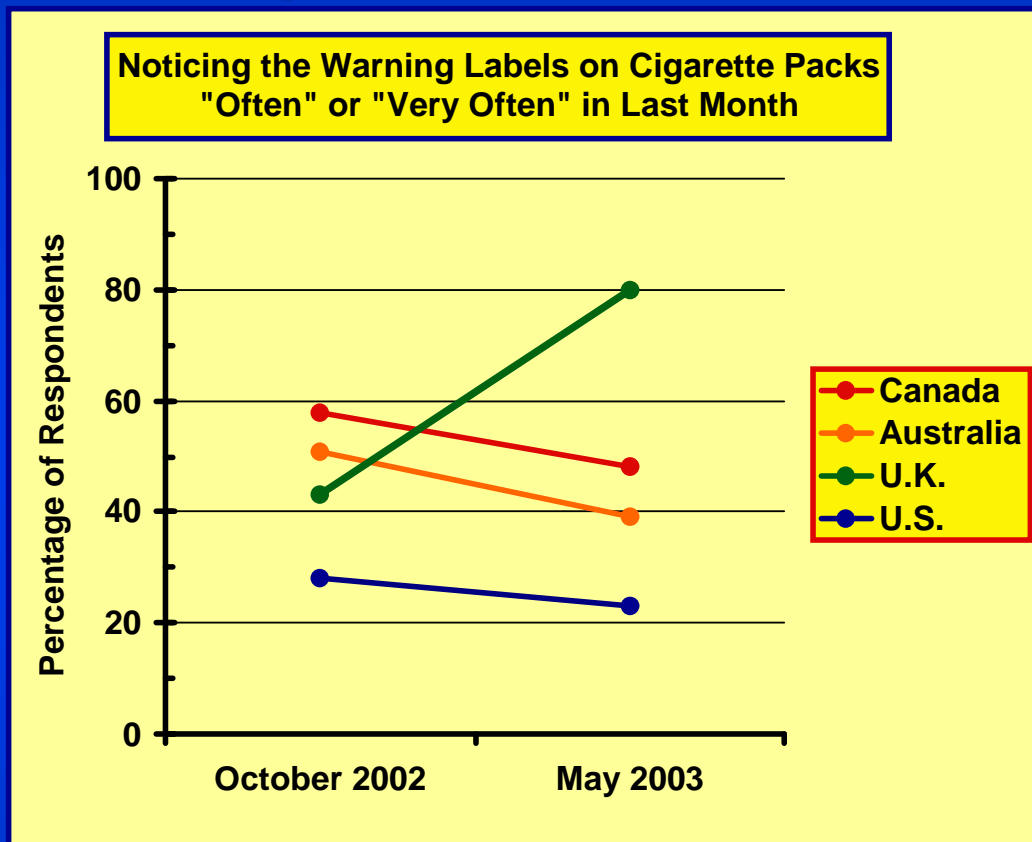
Australia



U.S.

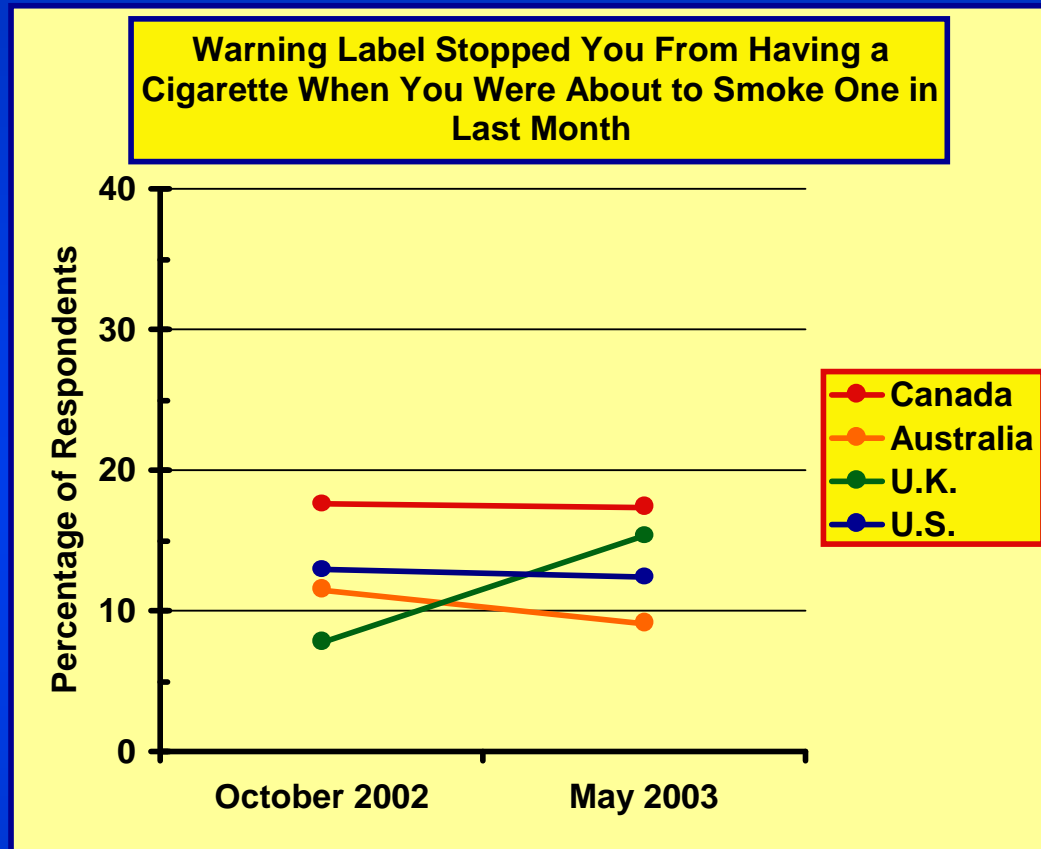


Noticed/Read or Looked Closely at the Warning Labels in Last Month



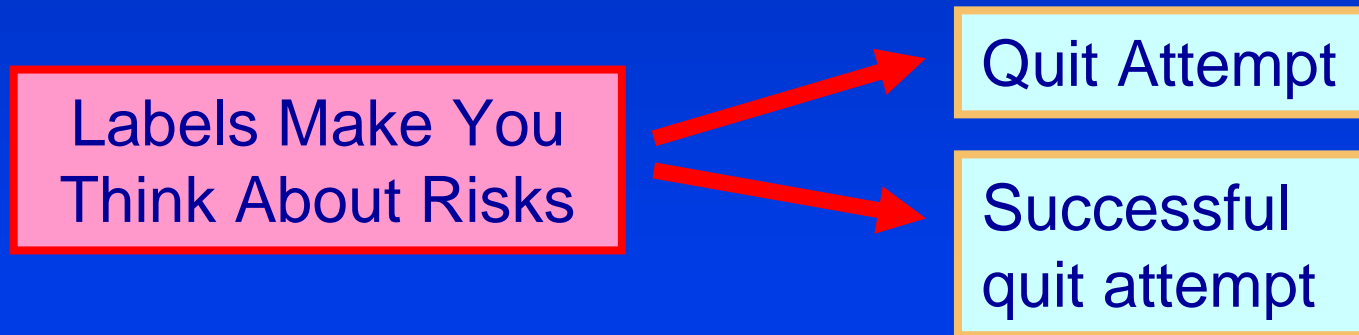
The enhancement of warning labels in the U.K. had a huge impact on labels salience/noticing, way above even Canada. But this is a measure of noticing, where mere novelty alone would be expected to have a huge effect

Label Stopped You From Smoking



Still a significant increase in U.K. compared to the other countries, but not above Canada at W2
Evidence for limitation of effect of mere text/size enhancements relative to graphic elements.

Relationship between label-specific variables and quitting



Smokers who report that the labels make them more likely to think about risks of smoking were:

- more likely to attempt to quit (OR = 1.14)
- more likely to successfully quit (OR = 1.89)

Thus, there is a connection between warning labels and quit attempts/successful quit attempts

Labels may have greater impact in low- and middle-income countries

How often in the last 6 months have...	% Often or Very Often	
	ITC-SE Asia	ITC 4-Country
1. you noticed the health warnings on cigarette packages?	Malaysia = 53% Thailand = 62%	Canada = 60%, Australia = 52% United Kingdom = 44% United States = 30%
2. you read or looked closely at the health warnings on cigarette packages?	Malaysia = 38% Thailand = 44%	Canada = 33%, Australia = 26% United Kingdom = 22% United States = 16%
3. the warnings stopped you from having a cigarette when you were about to smoke one?	Malaysia = 28% Thailand = 36%	Canada = 19%, Australia = 12% United Kingdom = 9% United States = 14%

SE Asia: Higher levels of salience than even Canada. Labels may have greater impact in low/middle income countries (few other information sources).

Non-price measures to reduce demand

- Comprehensive ban on advertising and promotion
- Bans on smoking in public and work places
- Increased consumer information
- **Increased access to cessation services and products (e.g. NRT)**

Increased access to smoking cessation

- Increased NRT availability significantly increases NRT use and reduces cigarette demand
- Lower NRT prices increase use of NRT
 - ◆ Higher cigarette prices raise NRT demand
- Lower NRT prices reduce cigarette demand
- More extensive advertising of NRT raises NRT demand

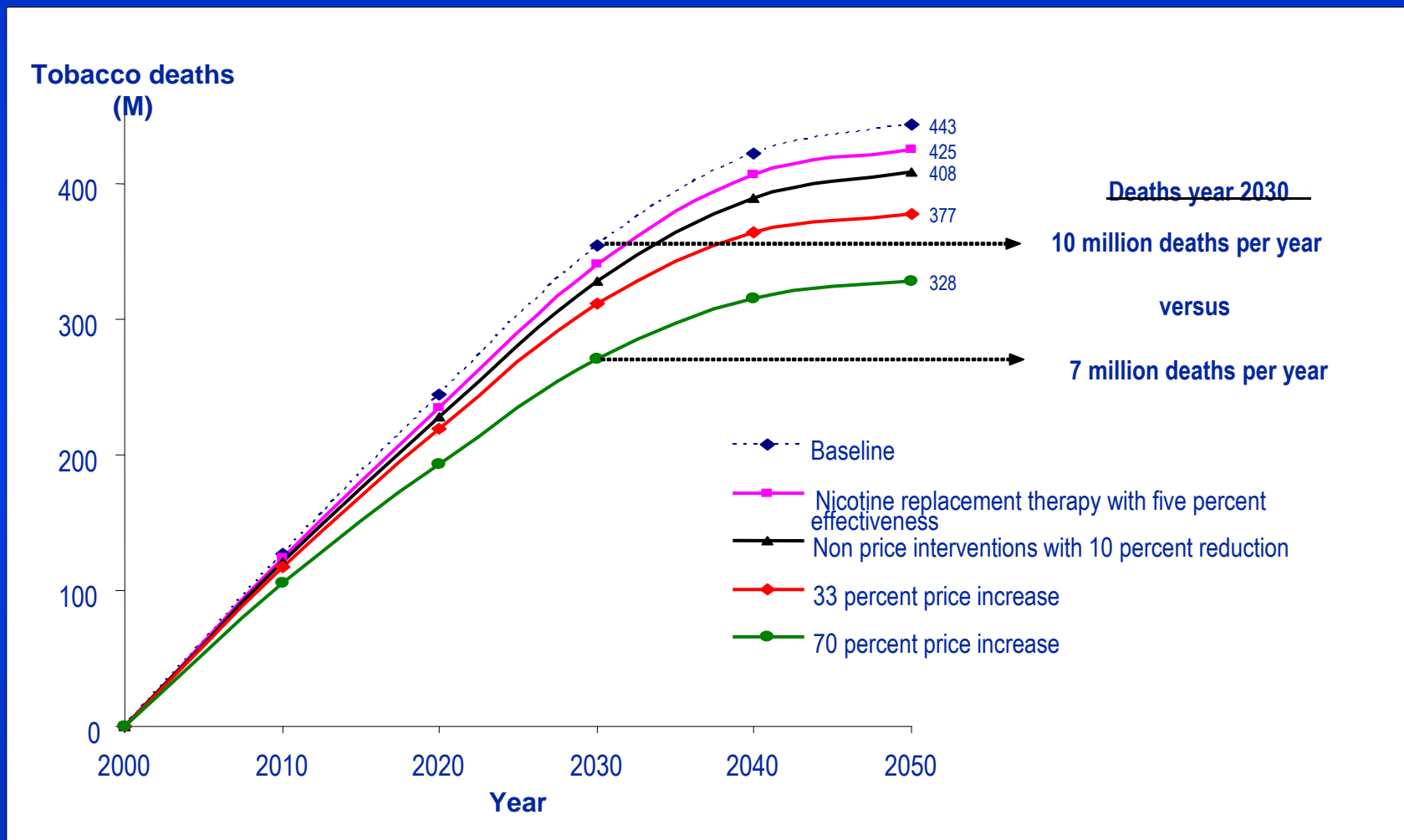
Source: Tauras and Chaloupka, 2003, 2005; Chaloupka and Tauras, 2004

NRT and cessation therapies

- **NRTs double the effectiveness of cessation efforts and reduce individuals' withdrawal costs**
- **NRTs often unavailable or expensive in many countries**
 - ◆ Particularly low and middle-income countries
- **Governments may widen access to NRT and other cessation therapies by:**
 - ◆ Reducing regulation
 - ◆ Conducting more studies on cost-effectiveness (especially in low/middle income countries)
 - ◆ Considering NRT subsidies for poorest smokers

Source: Novotny *et al.*, 2000

Potential impact of price increase, increased access to NRT, and set of non-price measures



Source: Jha, Chaloupka, et al., 2007

How cost-effective is tobacco control?

US dollars (2002) per healthy year life gained

<i>Region</i>	<i>Price increases of 33%</i>	<i>Non-price measures with effectiveness of 2-10%</i>	<i>NRT with effectiveness of 1-5%</i>
Low / middle income	3 to 42	54 to 674	55 to 761
High Income	85 to 1,773	1,166 to 14,572	175 to 3,781

Compares favorably to cost-effectiveness of other public health interventions

Source: *Jha, Chaloupka, et al., 2007*

Which interventions are ineffective at reducing consumption?

- **Prohibition**
- **Trade restrictions**
- **Youth access restrictions**
 - ◆ May be important for political purposes
 - ◆ Impact in low/middle-income countries less clear
- **Crop substitution**
 - ◆ Potentially important in aiding transition of tobacco farmers
- ***Control of smuggling is the only exception and it is the key supply-side measure***

Source: Jacobs *et al.*, 2000; Woolery *et al.*, 2000; Taylor *et al.*, 2000

Myths and Facts about the “costs” of tobacco control?

- **Cost to individuals, especially the
poor**

Costs to Individuals

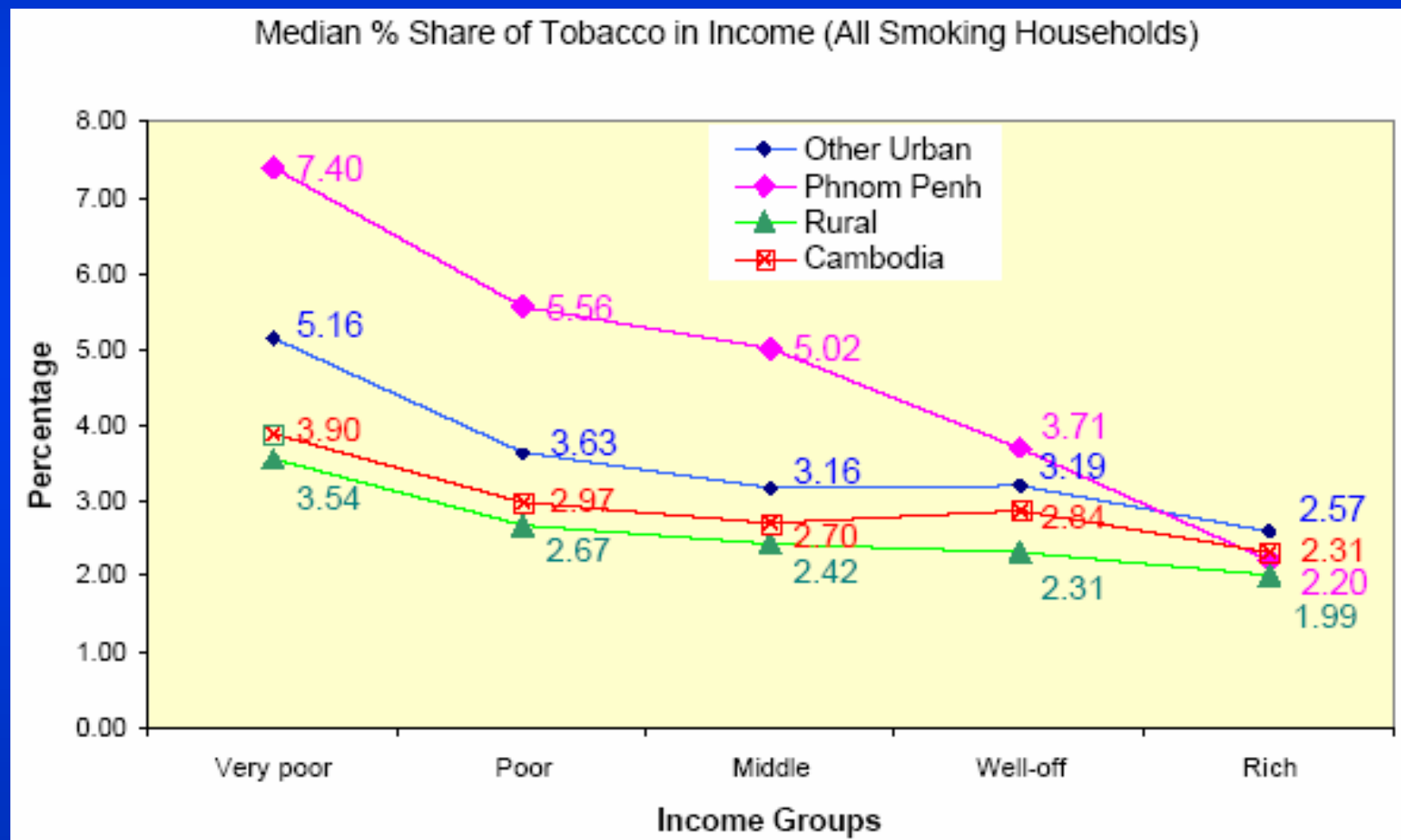
Myth: Governments should not raise cigarette taxes because such increases will harm low income smokers

Facts:

- Tobacco use concentrated in lowest income populations
- Low income populations most harmed by tobacco use
- Lowest income smokers most responsive to price changes

Implies tax increases can be progressive

Tobacco Spending and Income Cambodia



Source: Ross, 2005

Myths and Facts about the “costs” of tobacco control?

- **Cost to individuals, especially the poor**
 - ◆ greatest reductions in tobacco use in response to tax & price increases
 - ◆ use of revenues to help low-income smokers quit and/or support other programs targeting poorest can offset any negative impact

Myths and Facts about the “costs” of tobacco control?

- Cost to individuals, especially the poor
- **Job losses**

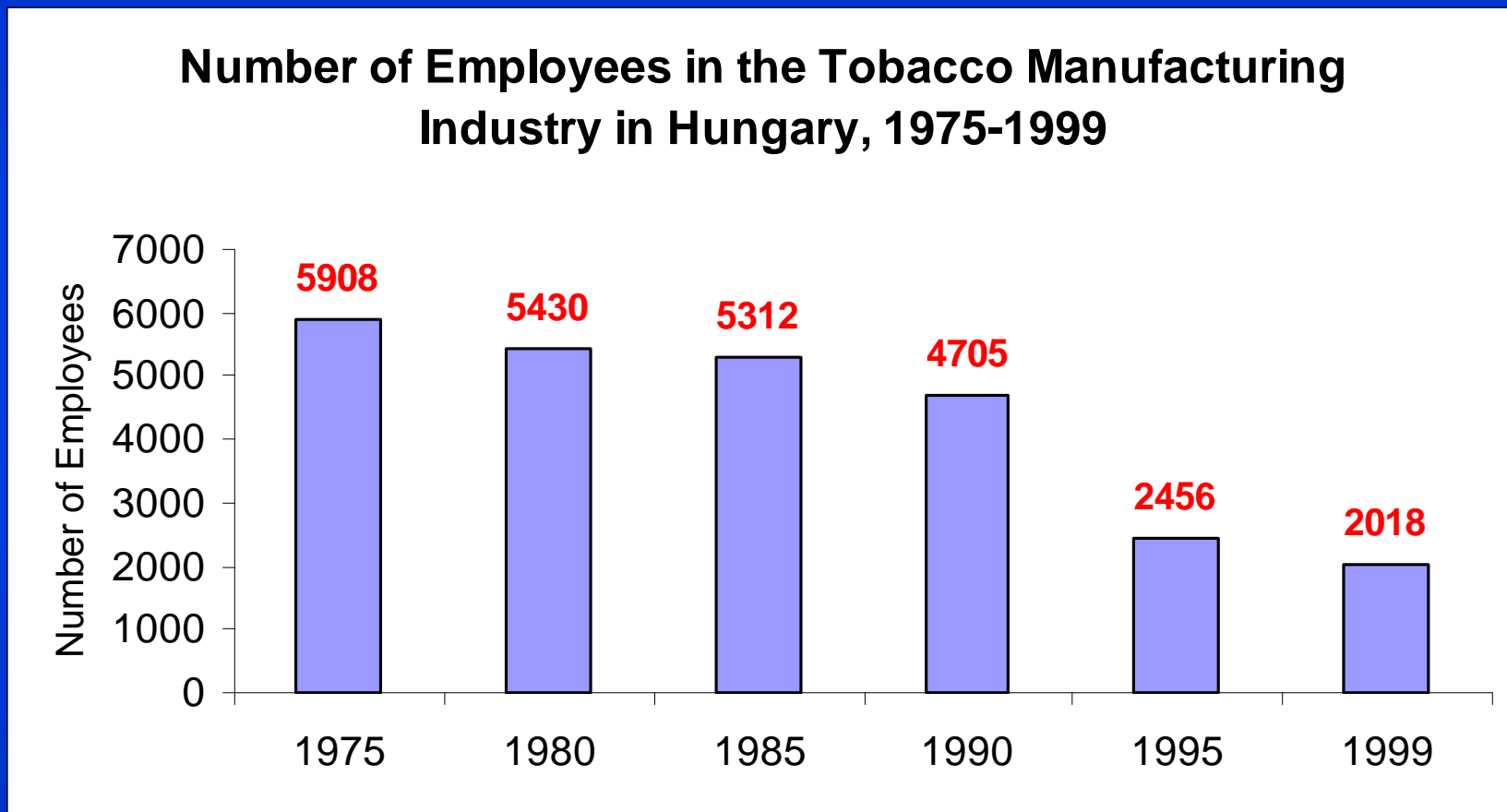
Job Losses

Myth: Governments should not raise cigarette taxes or engage in other tobacco control efforts because this will lead to significant job losses

Facts:

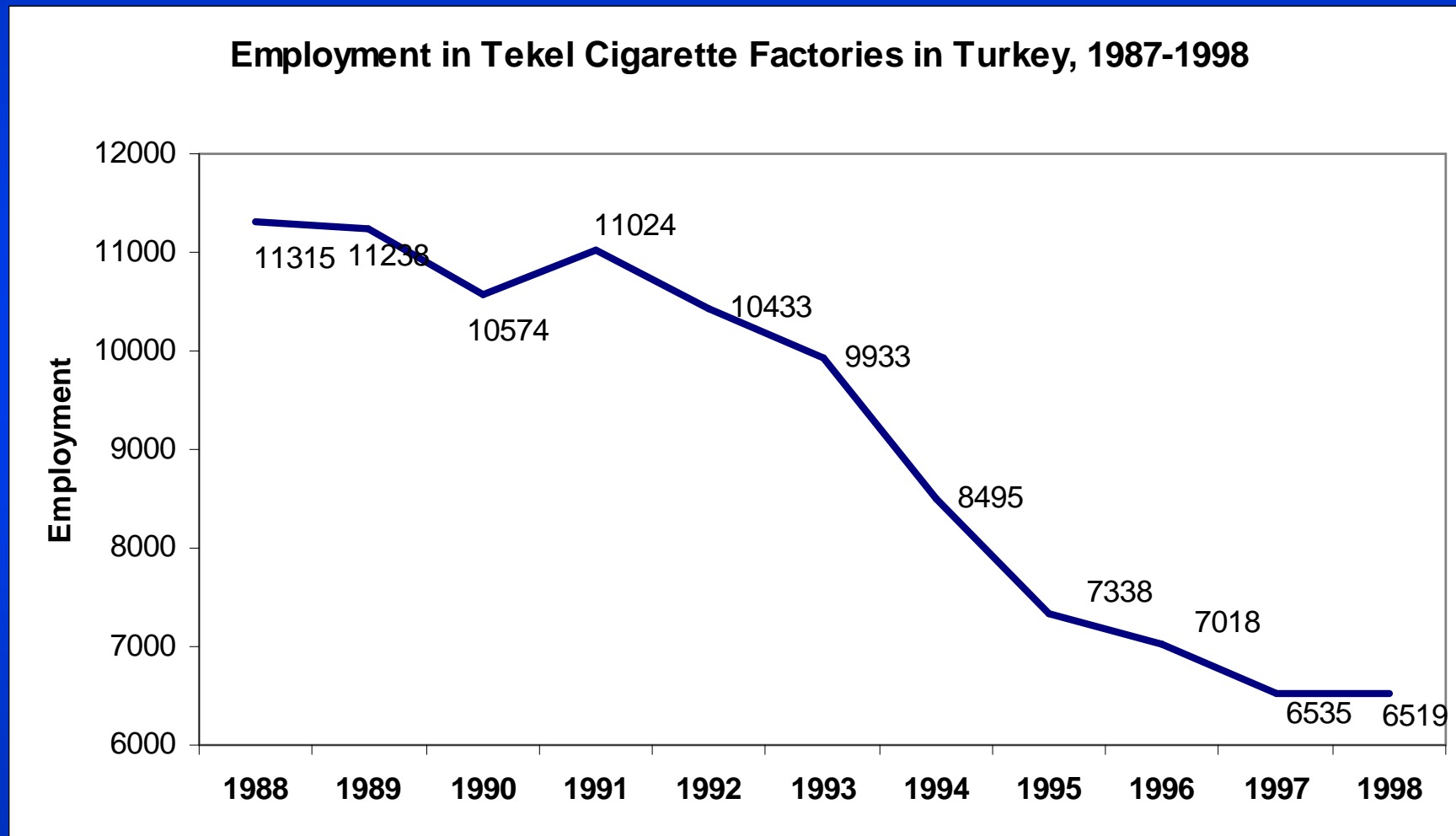
- Tobacco-related employment falling in most countries as result of industry activities
- Presence of tobacco growing and manufacturing does not imply dependence on growing/manufacturing

Tobacco Taxes and Jobs



Source: Yurekli, 2001

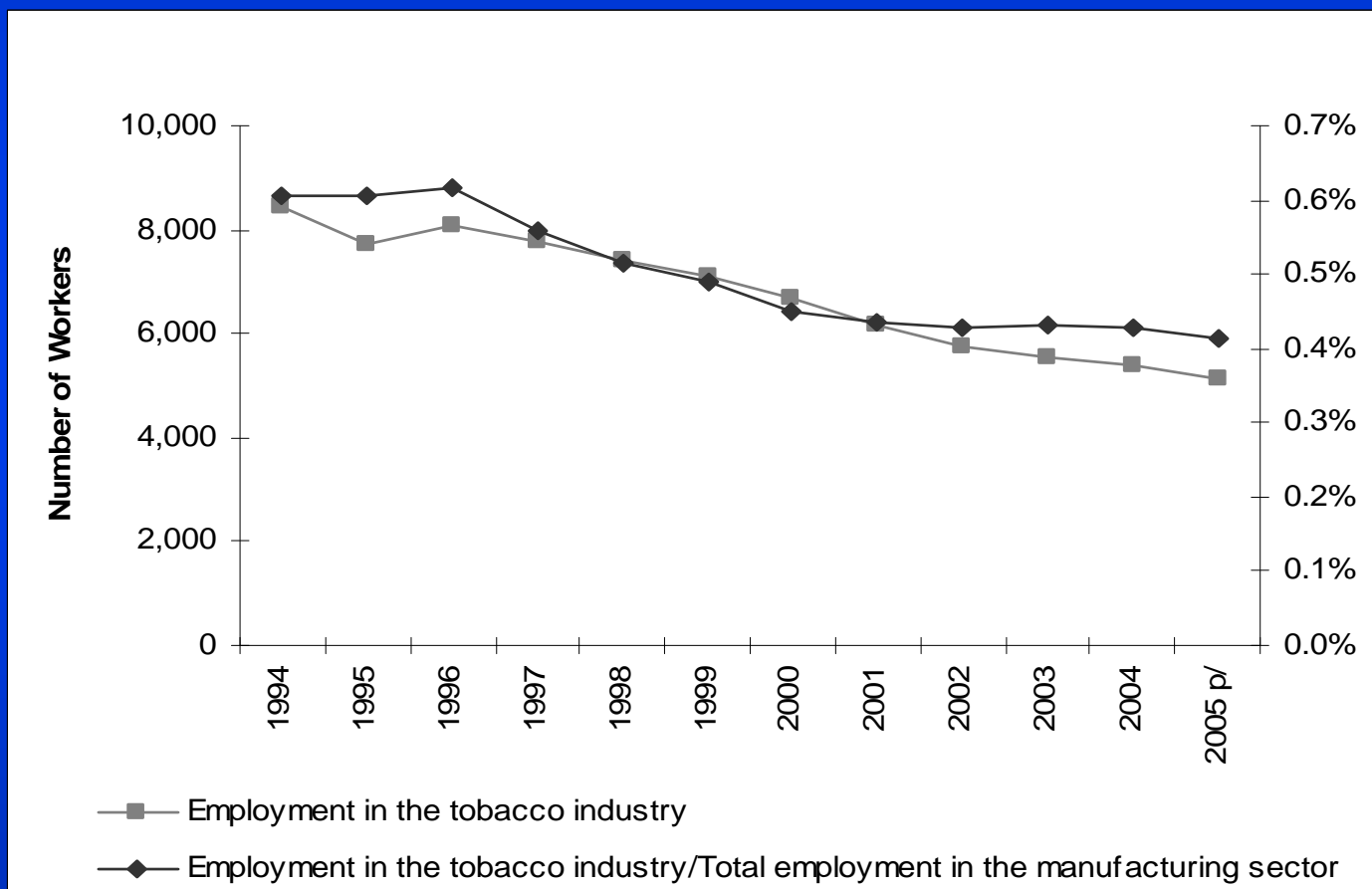
Tobacco Taxes and Jobs



Source: Yurekli, 2001

Tobacco Taxes and Jobs

Tobacco Industry Employment and Share Of Manufacturing Employment, Mexico, 1994-2005



Source: Sáenz de Miera Juárez, et al., 2007 (draft)

Studies on the employment effects of dramatically reduced or eliminated tobacco consumption

<i>Type of country</i>	<i>Name and year</i>	<i>Net change as % of economy in base year given</i>
Net Exporters	US (1993)	0%
	UK (1990)	+0.5%
	Zimbabwe (1980)	-12.4%
Balanced Tobacco Economies	South Africa (1995)	+0.4%
	Scotland (1989)	+0.3%
Net Importers	Bangladesh (1994)	+18.7%

Source: Buck and others, 1995; Irvine and Sims, 1997; McNicoll and Boyle 1992, van der Merwe and others, background paper; Warner and others 1996

Myths and Facts about the “costs” of tobacco control?

- Cost to individuals, especially the poor
- Job losses
- **Revenue losses**

Revenue Losses

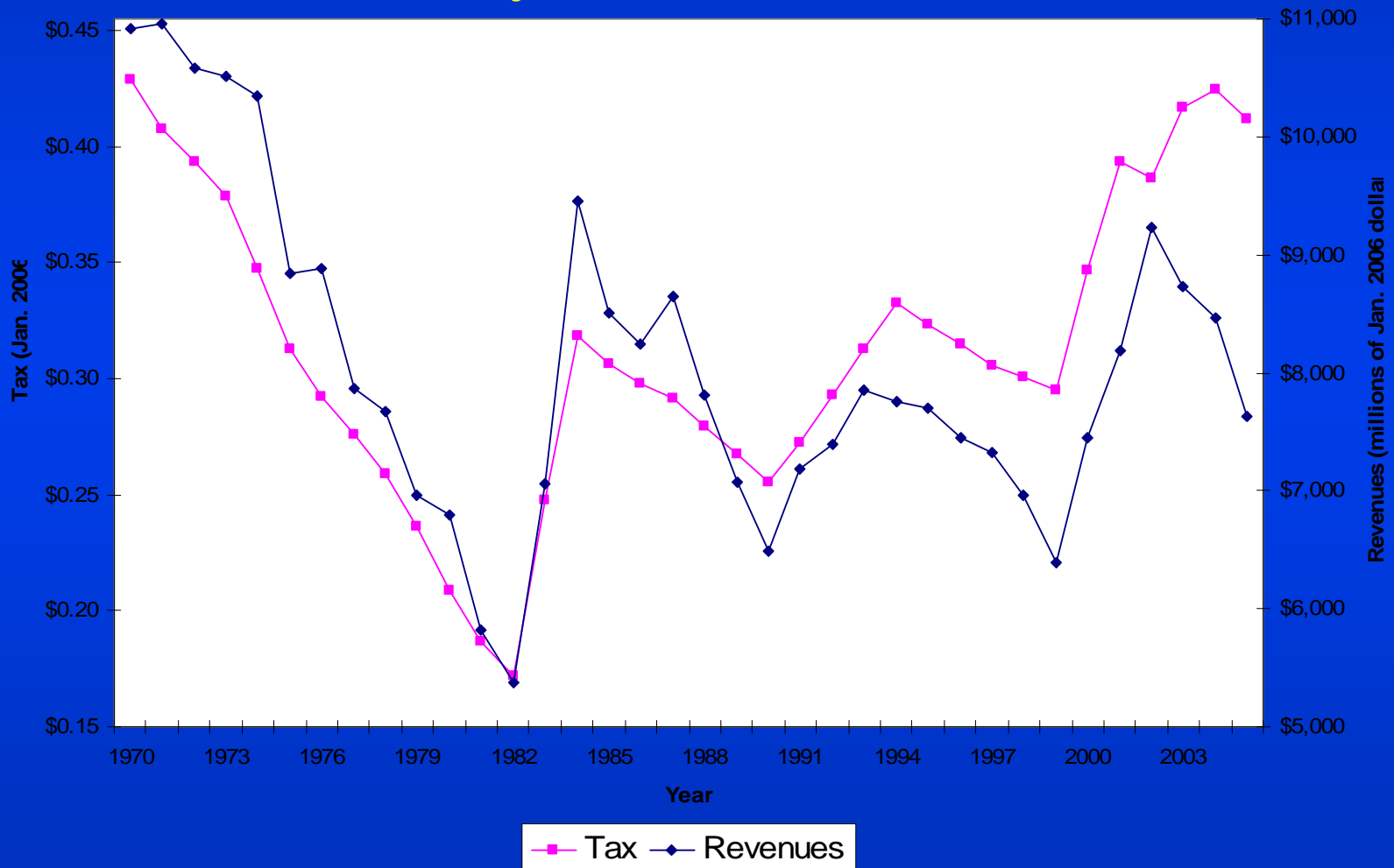
Myth: Governments should not raise cigarette taxes because reduced consumption and increased tax avoidance/smuggling will result in lost revenues

Facts:

- Revenues rise when tobacco taxes rise even as consumption falls
- Revenues rise even if tax avoidance and smuggling increase

Tobacco Taxes and Revenues

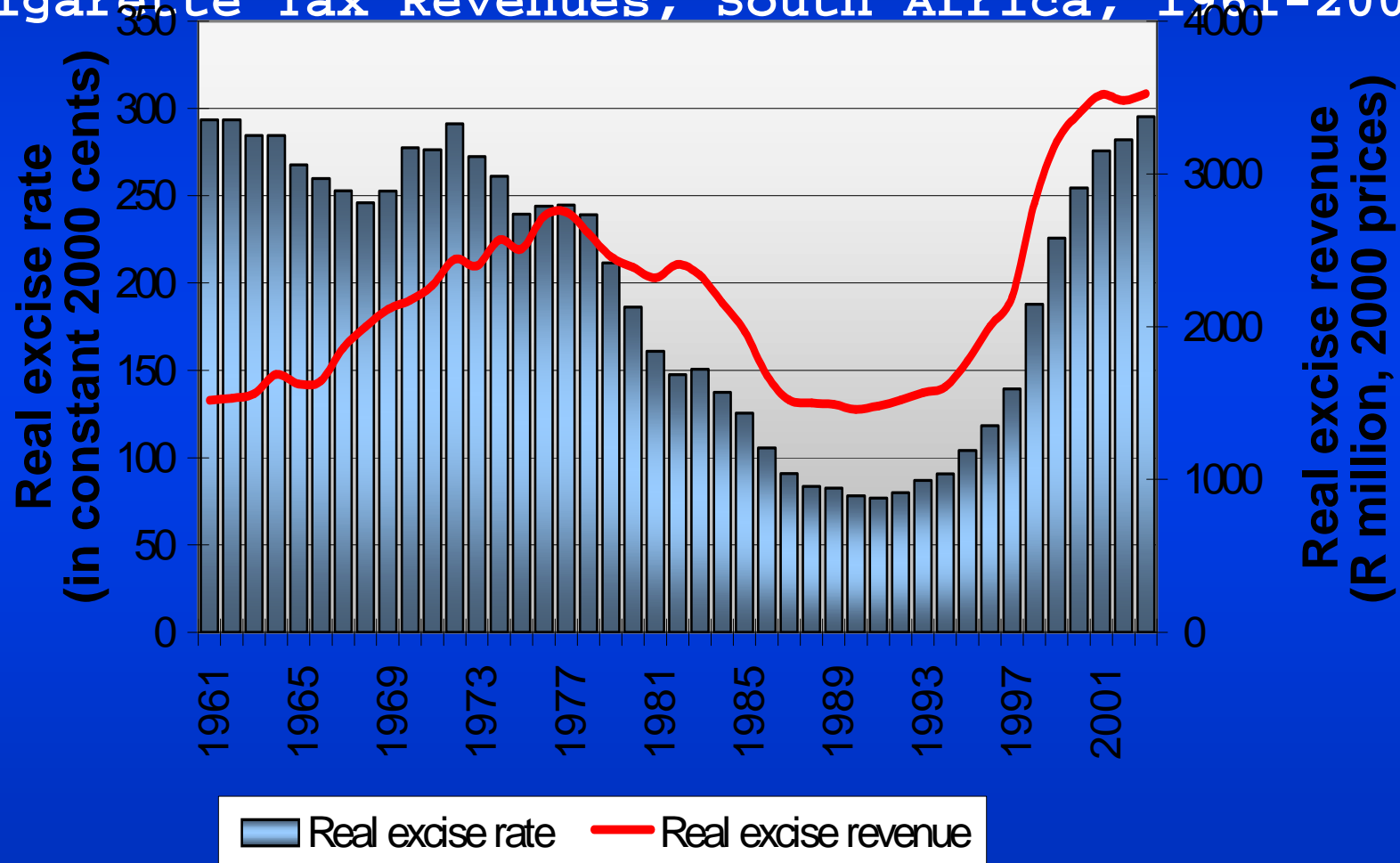
Federal Cigarette Tax and Tax Revenues,
Inflation Adjusted, United States, 1970-2005



Source: *Tax Burden on Tobacco*, 2006, and author's calculations

Tobacco Taxes and Revenues

Inflation Adjusted Cigarette Taxes and
Cigarette Tax Revenues, South Africa, 1961-2003



Source: Van Walbeek, 2003

Myths and Facts about the “costs” of tobacco control?

- Cost to individuals, especially the poor
- Job losses
- Revenue losses
- **Smuggling**

Smuggling

Myth: Governments should not raise cigarette taxes because higher taxes will result in significant tax avoidance and smuggling

Facts:

- Other factors as or more important than tax levels
- Benefits of higher taxes exist despite smuggling
- Effective options exist for curbing smuggling

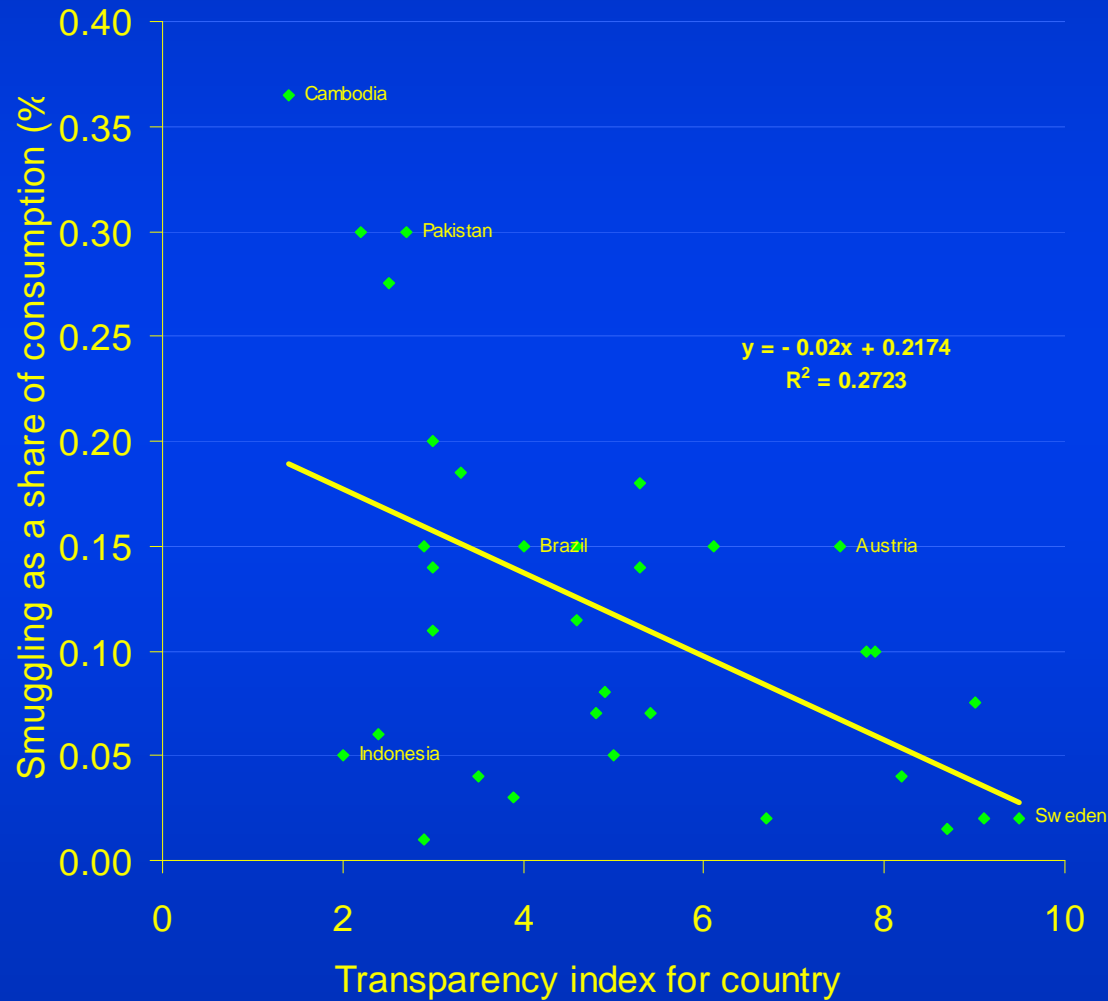
Smuggling of Cigarettes

- **Industry has economic incentive to smuggle**
 - ◆ Increase market share and decrease tax rates
- **Estimated 6 to 8.5% of total consumption**
- **Non-price variables important**
 - ◆ Perceived level of corruption more important than cigarette prices
- **Tax increase will lead to revenue increase, even in the event of increased smuggling**

Source: Merriman *et al.* 2000; Joosens, 2000; BAT, 1998

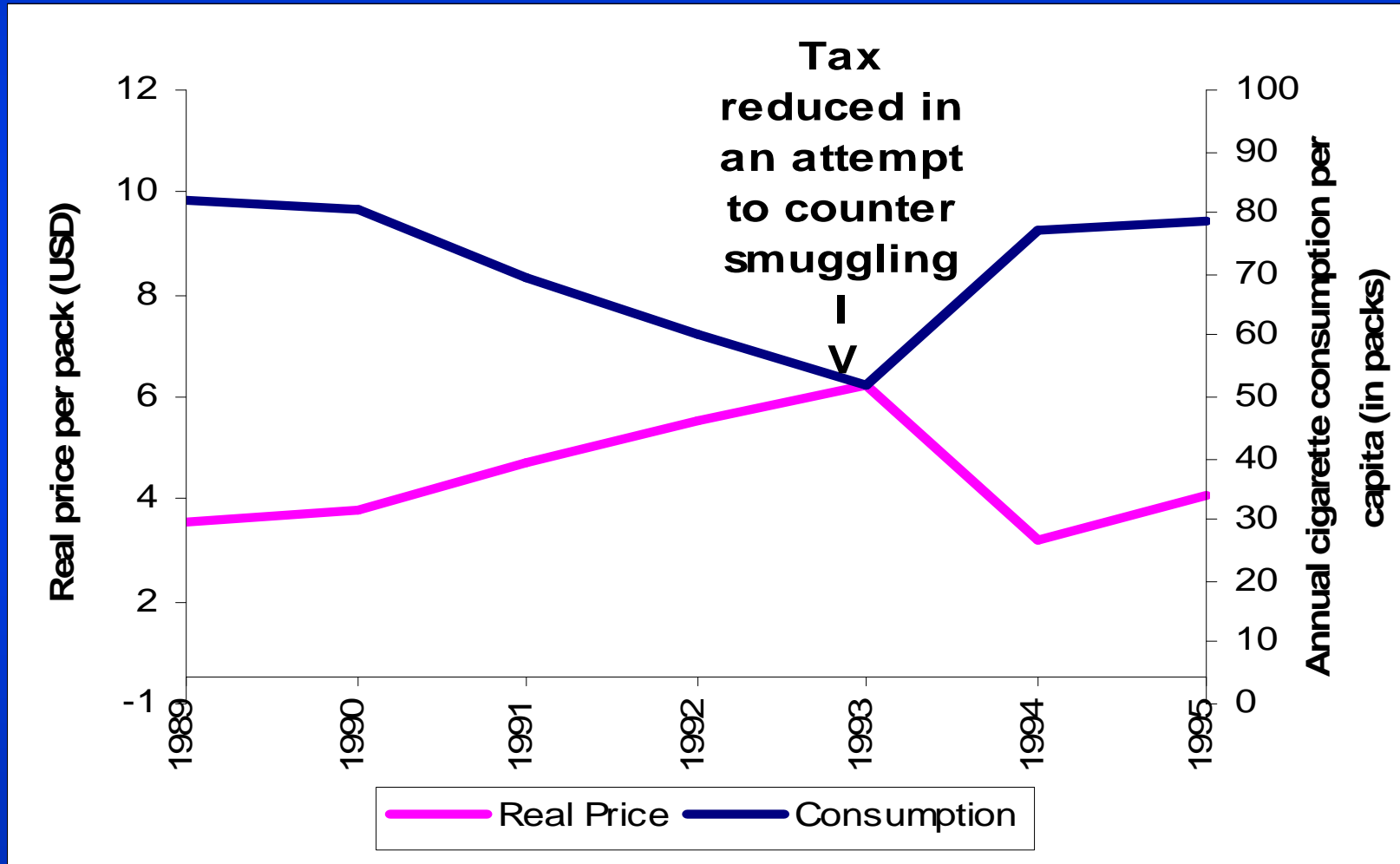
Tobacco smuggling tends to rise in line with the degree of corruption

Smuggling as a function of transparency index



Source: Merriman *et al.*, 2000

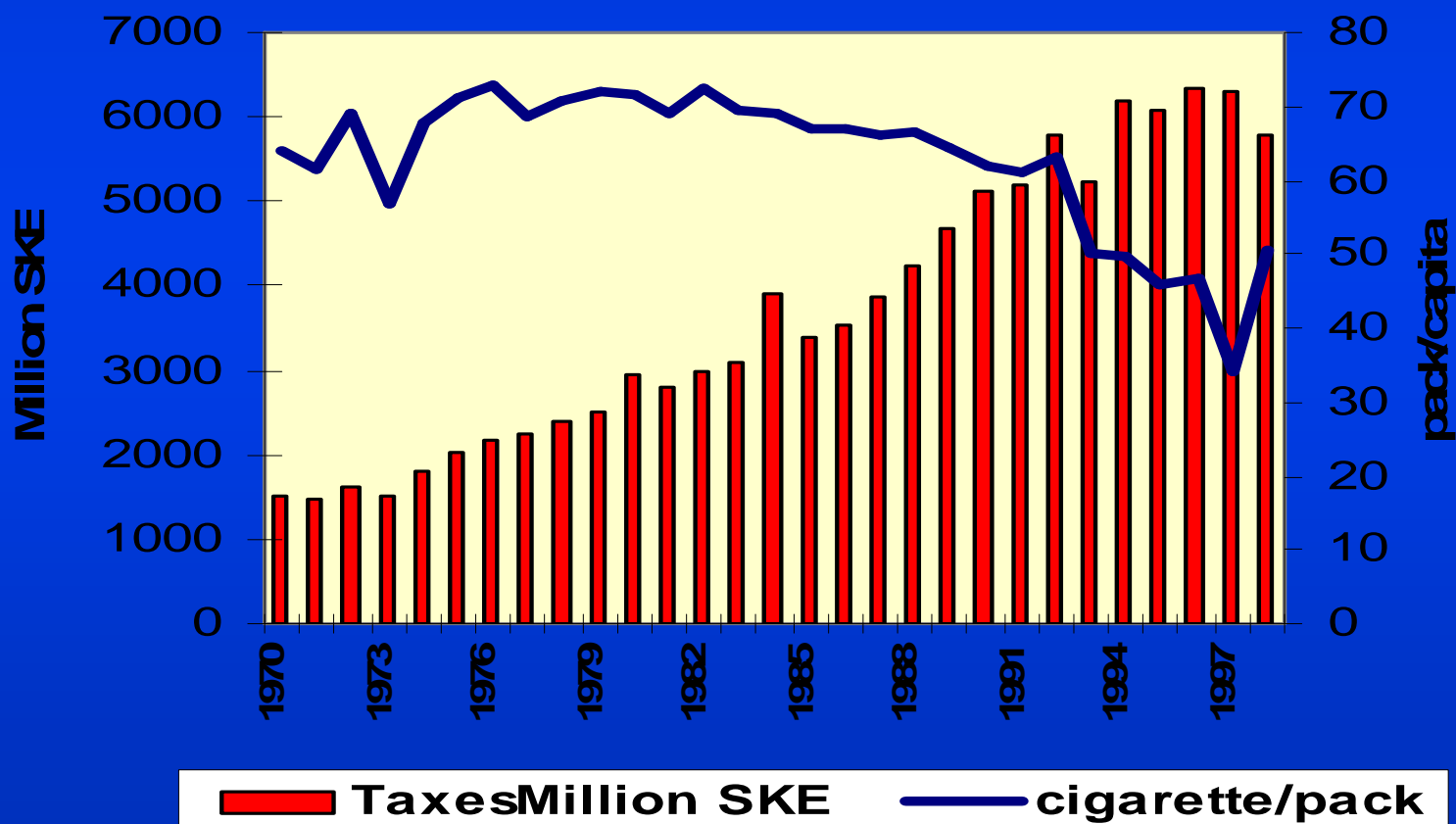
Canada Sharply Reduced Taxes in 1993



Source: World Bank, 2003

Sweden Reduced Cigarette Taxes by 17% in 1998

Cigarette Tax Revenue and Consumption in Sweden, 1970-1998



Source: World Bank, 2003

Control of Smuggling

- **Countries need not make a choice between higher cigarette tax revenues and lower cigarette consumption**
 - ◆ Higher tax rates can achieve both
- **Effective control measures of smuggling exist**
 - ◆ Tax stamps, particularly high tech stamps
 - ◆ Focus on large container smuggling
 - ◆ Prominent local language warnings and other pack markings
 - ◆ Increase penalties and strengthen enforcement
 - ◆ Licensing of all involved in tobacco product distribution
- **Multilateral tax increases help combat smuggling**

Source: Merriman *et al.* 2000; Joosens, 2000; BAT, 1998

Summary

- Tobacco deaths worldwide are large and growing
- Specific market failures provide economic rationale for government intervention
- Tax increases are highly effective in reducing tobacco use
- Other demand reducing tobacco control policies called for in FCTC are very effective in reducing tobacco use
- Economic arguments about the costs of tobacco taxation and tobacco control are misleading and often false



www.tobaccoevidence.net

[**www.itcproject.org**](http://www.itcproject.org)

