IN THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

ROBERT GORDON,	)	
Plaintiff	)	
vs.	)	Case No. 1:10-cv-01092-RCL
ERIC HOLDER, *et al*.,	)	
Defendants	)	

MEMORANDUM OF AMICI CURIAE CAMPAIGN FOR TOBACCO-FREE KIDS, AMERICAN CANCER SOCIETY CANCER ACTION NETWORK, AMERICAN HEART ASSOCIATION, AMERICAN LUNG ASSOCIATION, AND AMERICAN LEGACY FOUNDATION IN OPPOSITION TO PLAINTIFF ROBERT GORDON'S APPLICATION FOR A PERMANENT INJUNCTION AND DECLARATORY RELIEF

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TABLE OF CONTENTS

TABLE OF AUTHORITIES

CASES

STATUTES

Federal statutes

State statutes

OTHER SOURCES

Orzechowski & Walker, *The Tax Burden on Tobacco,* 2013 8

Ribisl, Kurt M., *et al*., "Are the Sales Practices of Internet Cigarette Vendors Good Enough to Prevent Sales to Minors?," *American Journal of Public Health* 92(6):940-41, June 2002, http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447488/pdf/0920940.pdf 11

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Relevant text of other sources for which links are not indicated are not provided is at Appendix B.

Amici Curiae Campaign for Tobacco-Free Kids, American Cancer Society Cancer Action Network, American Heart Association, American Lung Association, and American Legacy Foundation, submit this memorandum in support of the position of the defendant, Eric Holder, Attorney General of the United States. This memorandum is filed with the consent of all parties.

INTERESTS OF AMICI

Amici are non-profit organizations devoted to improving the public health and are among the premier tobacco-control advocates in the country. They have long been active in research, education, and public policy to raise awareness of the health consequences of tobacco use and to limit the sale of tobacco to minors. A description of each organization is at Appendix A.

INTRODUCTION

The relief sought by the plaintiff in this case—a declaration that provisions of the Prevent All Cigarette Trafficking Act , 15 U.S.C. § 376 *et seq*., ("PACT Act") are unconstitutional on their face and issuance of a permanent injunction barring the enforcement of these provisions by the federal government anytime, anywhere, against any party regardless of the facts of the case--would materially damage the ability of State, local and federal governments to protect the public health against cigarette smoking, the largest preventable cause of death in the nation. There is no legitimate basis for such relief.

The PACT Act was enacted to remedy significant problems that had diluted the effectiveness of both federal and state efforts to protect the public from the nation's leading preventable cause of death. The magnitude of the public health problem posed by cigarette smoking—480,000 deaths each year—twenty percent of all deaths, the staggering health care costs imposed by cigarette smoking, the fact that virtually all smokers initiate smoking before

they reach adulthood, and the goal of reducing youth smoking as a public health priority all demonstrate the importance of state and federal programs designed to protect the public health by regulating the sale of tobacco products. The maintenance of higher retail prices for cigarettes is the single most effective tobacco control measure in reducing youth smoking, and the most effective method of maintaining such retail prices is the enactment and enforcement of excise taxes on such products. In many jurisdictions, taxes and fees represent nearly half the total retail price of the product. The sale of cigarettes at prices that do not reflect such taxes subverts effective state and federal tobacco control programs. Delivery sales of cigarettes pose a particular threat to the integrity of such programs because states have found it difficult to enforce the payment of use taxes on products sold in such transactions unless sellers are required to collect the tax. Moreover, it is more difficult to enforce prohibitions on sales to minors in non-face-to-face transactions, making it more likely that such transactions will put cigarettes in the hands of minors.

The rise of the Internet as a medium for the marketing of tobacco products coincided with increases in state excise taxes on such products. The Internet enabled delivery sellers to solicit sales in a wide potential market in numerous states cheaply and effectively without having a physical presence in a state and to consummate sales easily without face-to-face contact with the buyer. In addition, the Internet and related technology enabled sellers to discriminate easily between potential buyers in jurisdictions that continued to permit such sales and jurisdictions in which such sales were prohibited and to determine electronically the level of the applicable taxes. In response to this market opportunity, hundreds of Internet sellers began to market tobacco products, often representing on their websites that sales would be made free of state taxes and often requiring little or no proof of the buyer's age.

Eleven states concluded that delivery sales of tobacco products were not compatible with effective tobacco control policies and prohibited such sales altogether. The states that have not prohibited such transactions continue to provide an ordered and regulated market for such products that permits such delivery sales to be made. The market for tobacco products in all states is comprehensively regulated and all sellers in the market, in exchange for compliance with such regulations, receive the benefit of being able to sell their products in that market, despite the health care costs these products impose on the states and the other public health consequences they impose on the citizens of the state. Delivery sellers in the states that continue to permit such sales also benefit from the enforcement of such taxes and regulations against their principal competitors—in-state retailers who sell cigarettes in face-to-face transactions.

The PACT Act is a public health measure designed to ensure that the most effective strategy to reduce smoking and keep cigarettes out of the hands of children is not subverted. The principal method for collecting excise taxes on face-to-face sales is through the sale by the state of excise tax stamps to distributors who are licensed by the state to affix such stamps, which evidence payment of the tax. These distributors typically do not sell directly to consumers, but rather, after affixing the stamps, make sales to retailers for resale. The tax is then passed on to consumers who buy the cigarettes at retail. However, for out-of-state delivery sales on which stamps are not affixed the applicable tax is a use tax the incidence of which is on the local purchaser. Because the use tax is so difficult to enforce, the PACT Act conditions the right of a delivery seller to make delivery sales on demonstrating either that the excise tax has been paid (as evidenced by the placement of tax stamp) or that the use tax has been paid prior to shipping the product. The PACT Act does not impose a tax on a delivery seller; rather, it requires the delivery seller to demonstrate that a tax, the incidence of which is on the buyer, has been paid as

a condition of making a delivery sale. This condition is essential for the protection of the public health.

ARGUMENT

I. The provisions of the PACT Act at issue in this case are critical to protect the public health against the nation's largest preventable cause of death.

A. Tobacco is the leading preventable cause of death in the United States and the vast majority of smokers begin before they reach adulthood.

480,000 Americans die every year from tobacco-related disease, including cancer, heart disease and respiratory disease.[1] This figure represents 20% of all deaths in the United States and is more than all deaths from AIDS, alcohol, motor vehicles, homicide, illegal drugs and suicide combined.[2] Not only does smoking cause lung cancer, but it also causes a host of other fatal

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[1] U.S. Department of Health and Human Services (HHS), *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General.* Atlanta, GA: HHS, U.S. Centers for Disease Control and Prevention (CDC), National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014 (p. 11), http://www.surgeongeneral.gov/library/reports/50-years-of-progress/full-report.pdf. Hereinafter referred to as "2014 Surgeon General's Report." This report, compiled with the participation of the nation's most eminent research scientists, surveys the evidence from thousands of studies and is widely considered authoritative.

[2] 2014 Surgeon General's Report (Chapter 11). (AIDS) CDC, "Table 12a. Deaths of persons with diagnosed HIV infection ever classified as stage 3 (AIDS), by year of death and selected characteristics, 2008-2010 and cumulative—United States," *HIV Surveillance Report, 2011*, Vol 23, February 2013 (p. 40), http://www.cdc.gov/hiv/pdf/statistics_2011_HIV_Surveillance_Report_vol_23.pdf#Page=40; (Alcohol) CDC, *Alcohol-Related Disease Impact (ARDI)*, http://apps.nccd.cdc.gov/DACH_ARDI/Default/Default.aspx; Mokdad, AH, et al., "Actual Causes of Death in the United States, 2000," *Journal of the American Medical Association (JAMA)* 291(10):1238-1245, March 10, 2004, https://www.uic.edu/sph/prepare/courses/PHLearning/resources/Actual%20Causes%20of%20Death%20in%20the%20United%20States,%202000.pdf. [with correction in *JAMA* 293(3):298, January 19, 2005]; (Motor vehicle) U.S. Department of Transportation, National Highway Traffic Safety Administration, *Fatality Analysis Reporting System General Estimates System: 2011 Data Summary*, 2013, http://www-nrd.nhtsa.dot.gov/Pubs/811755DS.pdf; (Homicide, Suicide, Drug-Induced) Murphy, S, et al., "Deaths: Final Data for 2010," *National Vital*

diseases, including stroke, heart disease, chronic obstructive pulmonary disease (COPD) and cancers of the, larynx, oral cavity, bladder, pancreas, cervix, kidney, stomach, blood, liver, colon and rectum, and esophagus.[3] Smoking reduces life expectancy by at least 10 years.[4] Moreover, smoking kills not only smokers but non-smokers as well: over 40,000 Americans die each year from second-hand smoke.[5] Smoking costs at least $289 billion per year in health care spending and loss of productivity due to disease and premature death.[6] State and federal governments bear much of these costs.[7]

Nicotine, which is present in all tobacco products, is exceedingly addictive.[8] Children who experiment with cigarettes frequently experience the symptoms of addiction while they still believe they are only experimenting.[9]

Statistics Reports, 61(4), May 8, 2013, http://www.cdc.gov/nchs/data/nvsr/nvsr61/nvsr61_04.pdf.

[3] 2014 Surgeon General's Report (p. 4). See also, HHS, *The Health Consequences of Smoking: A Report of the Surgeon General*, Atlanta, GA: HHS, CDC, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2004 (Executive Summary p. 1-13), http://www.cdc.gov/tobacco/data_statistics/sgr/2004/complete_report/index.htm.

[4] 2014 Surgeon General's Report. See also, Jha, Prabhat, et al., "21st-Century Hazards of Smoking and Benefits of Cessation in the United States," *New England Journal of Medicine*, 368(4):341-50, January 2013. http://www.nejm.org/doi/pdf/10.1056/NEJMsa1211128.

[5] 2014 Surgeon General's Report (p. 666).

[6] 2014 Surgeon General's Report (p. 679).

[7] 2014 Surgeon General's Report (Chapter 12). See also, CDC, *Best Practices for Comprehensive Tobacco Control Programs—2014.* Atlanta: HHS, CDC, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014, http://www.cdc.gov/tobacco/stateandcommunity/best_practices/pdfs/2014/comprehensive.pdf.

[8] 2014 Surgeon General's Report (p. 109-113). See also, HHS, *The Health Consequences of Smoking—Nicotine Addiction: A report of the Surgeon General*, Rockville, MD: HHS, CDC, Center for Health Promotion and Education, Office on Smoking and Health, 1988, http://profiles.nlm.nih.gov/ps/access/NNBBZD.pdf.

[9] 2014 Surgeon General's Report. U.S. Department of Health and Human Services, *Preventing Tobacco Use Among Youth and Young Adults: A Report of the Surgeon General.* Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on

Ninety percent of adult smokers start at or before age 18.[10] Because so few smokers start in adulthood, preventing youth smoking is a key public health strategy. Yet despite laws in all 50 states prohibiting the sale of tobacco products to those under age 18, nearly one in six high school students still smokes cigarettes.[11] One-third of the children who become regular smokers will die prematurely from a tobacco-related disease and 5.6 million children alive today will die from tobacco-related disease.[12] Both the States and the federal government have a strong interest in preventing youth smoking and in reducing smoking generally.

B. Maintaining high prices for cigarettes is the most effective strategy for reducing youth smoking.

It is universally recognized that increasing the price of cigarettes decreases their use.[13] Price elasticity estimates conclude that a ten percent increase in prices reduces cigarette demand among adults by three to five percent.[14]

The correlation between price and tobacco consumption by youth is substantially more pronounced. A ten-percent price increase is estimated to reduce the number of youth smokers by

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Smoking and Health, 2012 (Chapter 2), http://www.surgeongeneral.gov/library/reports/preventing-youth-tobacco-use/full-report.pdf. Hereinafter referred to as "2012 Surgeon General's Report."

[10] Calculated based on data from Substance Abuse and Mental Health Services Administration (SAMHSA), HHS, *Results from the 2012 National Survey on Drug Use and Health*, NSDUH: Summary of National Findings, 2013, using the Substance Abuse and Mental Health Data Archive (SAMHDA), http://www.icpsr.umich.edu/icpsrweb/SAMHDA/sda.

[11] CDC, "Youth Risk Behavior Surveillance—United States, 2013," *Morbidity and Mortality Weekly Report* 63(SS04):1-168, June 13, 2014, http://www.cdc.gov/mmwr/pdf/ss/ss6304.pdf.

[12] 2014 Surgeon General's Report (p. 666-667, 679).

[13] 2014 Surgeon General's Report (p. 788-789, 869); International Agency for Research on Cancer ("IARC"), *Effectiveness of Tax and Price Policies in Tobacco Control*, Handbooks of Cancer Prevention, Tobacco Control, vol. 14, Lyon, France, 2011, http://www.iarc.fr/en/publications/pdfs-online/prev/handbook14/handbook14-0.pdf.

[14] 2014 Surgeon General's Report (p. 789).

more than five percent.[15] Conversely, decreases in the prices of cigarettes and other tobacco products increase tobacco use.[16] There are several reasons why price changes have a greater impact on tobacco use among young people than on adult tobacco use including the lower disposable income of the typical young person; greater importance of peer behavior; shorter use history of younger tobacco users, suggesting that they may be less addicted; and a greater relative importance to young people of short-term costs.[17] These data have led experts to conclude that maintaining higher prices for cigarettes is the most effective strategy for reducing youth smoking rates.[18]

C. Imposing high excise taxes on tobacco products is designed to increase prices and reduce tobacco consumption by youth and also in the general population.

Because of the central role of prices in reducing consumption of tobacco products by youth, the imposition of excise taxes has become a major strategy for preventing youth tobacco consumption.[19] Excise taxes imposed on the sale of cigarettes are generally passed on to consumers in the sale price of cigarettes and thus function to reduce consumption of cigarettes generally and to reduce youth tobacco usage particularly.[20]

All states prohibit the sale of cigarettes without payment of an excise tax. Every state licenses wholesalers to sell cigarettes for resale. Licensed wholesalers are permitted to buy

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15 2014 Surgeon General's Report (p. 789).

16 2014 Surgeon General's Report (p. 796-797). 2012 Surgeon General's Report (p. 522-530).

17 Chaloupka, Frank J., "Contextual factors and youth tobacco use: policy linkages," *Addiction* 98(S1):147-50, 2003. Chaloupka, FJ, et al., "The taxation of tobacco products," in *Tobacco Control in Developing Countries*, Prabhat Jha and Frank J. Chaloupka, eds. Oxford: University Press, 2000 (p. 237-272).

18 2014 Surgeon General's Report (p. 869).

19 2014 Surgeon General's Report (p. 788-789, 869, 875). 2012 Surgeon General's Report (p. 697-707, 812).

20 2014 Surgeon General's Report (p. 788-790).

stamps from the state and are required to affix such stamps to cigarettes sold for resale within the state as evidence that the tax has been paid.[21] Retailers who buy these cigarettes are prohibited from selling cigarettes that do not have such stamps.

For delivery sales (i.e., sales for ultimate use, not for resale) from out of state, every state imposes a use tax, identical in amount to the excise tax. The incidence of the use tax is on the buyer. The use tax, if collected, thus has the same effect on the actual cost of cigarettes as the excise tax collected by wholesalers when cigarettes are sold for resale and the use tax, if collected, achieves the same public health goal.

In recent years, nearly every state has increased its excise tax on cigarettes.[22] These increases have been intended to reduce tobacco consumption and, particularly to reduce tobacco consumption by youth. Because the excise taxes in many states are large in relation to the total retail price of the product,[23] the existence of such taxes was designed to—and did—have a substantial effect on tobacco consumption.

Excise taxes on tobacco products are designed not simply to raise revenues, but also—and principally—to reduce tobacco consumption by raising the actual retail price of cigarettes.[24] The use of excise taxes to reduce consumption makes excise taxes on tobacco products unique.

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[21] Three states, North Carolina, South Carolina, and North Dakota, license wholesalers and collect a per-cigarette tax from them but do not require the affixing of stamps to evidence payment of the tax.

[22] See Campaign for Tobacco-Free Kids, *State Cigarette Tax Rates & Rank, Date of Last Increase, Annual Pack Sales & Revenues, and Related Data*, June 20, 2014, http://www.tobaccofreekids.org/research/factsheets/pdf/0099.pdf.

[23] Orzechowski & Walker, *The Tax Burden on Tobacco,* 2013 (pp. 18, 192). Campaign for Tobacco-Free Kids, *State Cigarette Tax Rates & Rank, Date of Last Increase, Annual Pack Sales & Revenues, and Related Data*, June 20, 2014, http://www.tobaccofreekids.org/research/factsheets/pdf0099.pdf.

[24] 2014 Surgeon General's Report (p. 788-789, 827, 869).

With regard to most other products, excise taxes are designed to raise revenues; they are not designed to discourage consumption. The interest of the State in ensuring that the taxes on tobacco products are actually collected is therefore more compelling than the State's interest in tax collection on such other products.[25]

D. Sales of tobacco products on which taxes are not collected increase consumption of cigarettes generally and increase youth consumption particularly and thereby subvert the public health policies of the states.

Taxes designed to increase the price of cigarettes serve their function only if they are collected and become an element in the purchase price. Cigarettes sold without payment of the tax subvert state public health policy in at least three ways; (1) they make cigarettes available at lower prices, thereby encouraging consumption, especially consumption by youth; (2) they create a price level that forces competitors, whose cigarettes are subject to the tax, to lower their prices in order to compete, thereby magnifying their price-reducing effect far beyond their actual sales; and (3) they impose substantial costs to the State in which they are consumed in the form of health care expenses resulting from their consumption.

E. The provisions of the PACT Act at issue in this case were designed to avoid the subversion of state public health policies.

States found that it was difficult and impracticable to collect use taxes on cigarettes sold from outside their borders direct to consumers in the State, in part because they had no effective way of identifying such sales and also because it was not cost-effective to pursue individual consumers for tax obligations of the magnitude typically at issue. A federal statute, the Jenkins

[25] By contrast, use taxes on most other goods are simply equivalent to sales tax and the State's interest in collecting such taxes is limited to protecting the flow of State revenues and in preventing unfair competition with in-state sellers.

Act, passed in 1949 and designed to address these issues, proved ineffective.[26] By requiring that out-of-state delivery sales be made at price levels that include state excise tax, the PACT Act was designed to protect the integrity of the States' public health policies. Protection of these policies also serves federal interests because the federal government, which also funds health care costs for the treatment of tobacco-related disease, has the same interest as the states in preventing sales of cigarettes to youth and in reducing the consumption of tobacco products generally. Sales of cigarettes made without payment of State excise taxes therefore subvert federal public health policies as well.[27]

Delivery sales made without payment of State excise taxes became a far more important factor in disrupting state and federal public health policy for several reasons. First, increases in the level of state excise taxes greatly increased the price advantage that could be achieved by avoiding payment of taxes and exacerbated the effect of tax avoidance on state public health policies. Second, the advent of the Internet facilitated development of delivery sales by making it easy for remote sellers to solicit sales in many states. Many such sellers advertised their cigarettes as "tax-free" and represented to purchasers that they could purchase cigarettes at prices far lower than those available from retailers subject to the tax.[28] Third, remote sellers employed few if any safeguards to avoid sales to minors—a pervasive problem in non-face-to-face sales.

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[26] 15 USC § 375. According to a 2002 report by the Government Accountability Office, of 147 websites offering cigarettes for sale, 114 "indicated the vendor's non-compliance [with the Jenkins Act] through a variety of statements posted on the sites." U.S. Government Accountability Office (GAO), *Internet Cigarette Sales: Giving ATF Investigative Authority May Improve Reporting and Enforcement*, Report No. 02-743, August 9, 2002 (p. 16), http://www.gao.gov/new.items/d02743.pdf. Hereinafter referred to as "2002 GAO Report."

[27] 2014 Surgeon General's Report (p. 674-675).

[28] Ribisl, Kurt M., Kim, Annice E., Williams, Rebecca S., "Sales and Marketing of cigarettes on the Internet: Emerging threats to tobacco control and promising policy solutions," in *Institute of Medicine, Ending the Tobacco Problem: A Blueprint for the Nation*, Washington, DC: National Academy Press, 2007. http://www.nap.edu/openbook.php?record_id=11795&page=653. See also, 2002 GAO Report.

Minors found that cigarettes were not only cheap if purchased through delivery sales but also easier to obtain.[29] Fourth, Internet sales and the emergence of computer technology associated with them made it far easier for delivery sellers to keep track of where their cigarettes were being ordered from, where they were shipped, and what the applicable taxes might be.[30] Even the smallest of Internet sellers now have the technology to determine and apply applicable taxes at the time the buyer places an order. In this case, Mr. Gordon's website permitted him to determine, on the basis of information input by the customer, where the cigarettes would be shipped and whether shipment was permitted by the applicable legal regime.[31] Such technological advances greatly simplified the task of determining, calculating, and collecting the applicable taxes.

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[29] Ribisl, Kurt M., *et al.*, "Are the Sales Practices of Internet Cigarette Vendors Good Enough to Prevent Sales to Minors?," *American Journal of Public Health* 92(6):940-41, June 2002, http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447488/pdf/0920940.pdf; Unger, JB, et al., "Are adolescents attempting to buy cigarettes on the Internet?," *Tobacco Control* 10:360-63, December 2001, http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1747617/pdf/v010p00360.pdf. [citing Kim, Annice E., *et al.*, "Sales practices of Internet cigarette vendors: Are they adequate to prevent minors from buying cigarettes online?," Roundtable presented at the Annual Meeting and Convention of the American Public Health Association, Boston, Massachusetts, November 2000, https://apha.confex.com/apha/128am/techprogram/paper_7434.htm]; Ribisl, Kurt M., *et al.*, "Internet Sales of Cigarettes to Minors," *JAMA* 290(10):1356-59, September 10, 2003, http://www.ttac.org/tcn/peers/pdfs/ICV_YouthPurchase-JAMA.pdf; Jensen, JA, et al., "Availability of tobacco to youth via the Internet," *JAMA* 291(15):1837, April 21, 2004; Williams, Rebecca S., *et al.*, "Internet cigarette vendors' lack of compliance with a California state law designed to prevent tobacco sales to minors," *Archives of Pediatrics and Adolescent Medicine* 160:988-989, 2006.

[30] For instance, Washington State Department of Revenue website on Destination-based sales tax and streamlined sales tax, http://dor.wa.gov/Content/FindTaxesAndRates/RetailSalesTax/DestinationBased/default.aspx. See also, Streamlined Sales Tax Governing Board, Inc., Certified Service Providers, http://www.streamlinedsalestax.org/index.php?page=Certified-Service-Providers.

[31] Declaration of Eric Proshansky, attached to the Memorandum of Amicus Curiae City of New York, Exhibit 8, Oct. 8, 2014.

F. Provisions of the PACT Act at issue in this case.

The provisions of the PACT Act are designed to ensure that applicable state and local taxes are paid on tobacco products sold in delivery sales by a seller in one state to a consumer in another state. Generally, the applicable tax is a use tax, the incidence of which falls on the buyer. However, Section 2A(d) requires the seller to ensure that such taxes have been paid before such cigarettes are shipped. The seller can comply with Section 2A(d) of the PACT Act in at least four different ways: it can obtain a stamping license from the State and affix State tax stamps to the cigarettes it sells; it can purchase stamped cigarettes from other sellers and sell them to customers in the State; prior to shipping cigarettes it can require proof from its customers that they have paid the use tax due on cigarettes they have ordered; or it can itself pay the tax due on such cigarettes and recover it from purchasers as part of the purchase price. In any of these cases, the cigarettes would have been subjected to the same tax as that paid by stamping agents with regard to face-to-face sales made within the State and the retail price would therefore reflect such payment. The Act imposes penalties for failure to comply with these provisions. Plaintiff's motion for a permanent injunction would make these provisions unenforceable against any delivery seller any time, regardless of the seller's contacts with the State into which the cigarettes are sold.

G. The federal interest in ensuring that all applicable taxes are paid.

As noted above, smoking imposes massive health care costs not only on the States, but on the federal government as well. Moreover, federal law prohibits the sale of cigarettes to minors. There is a strong *federal* interest in the prevention of sales to minors; in reducing the death and disease caused by tobacco products; and in preventing illicit cigarette trafficking. These interests

are explicitly recognized in the preamble to the PACT Act.[32] Thus, the PACT Act was designed to achieve federal as well as state objectives.

The PACT Act creates a federal obligation enforceable in federal court. The obligations created by the PACT Act are not simply obligations requiring the plaintiff to comply with State law; they are obligations not only distinct from but actually not present in state law and they do not extend the reach of state tax laws beyond constitutional limitations. As the Court of Appeals observed, "the liability for sales and use taxes fall primarily on the [in-state] buyer." 721 F.3d at 641. There is no question that a state has the constitutional authority to impose a use tax on an in-state buyer but, as noted by the Court of Appeals, "states find it both expensive and difficult to track . . . and to collect the applicable tax directly from [such buyers]." *Id.* at 642. Also as noted by the Court of Appeals, a previously enacted federal statute, the Jenkins Act, designed to eliminate this opportunity for tax evasion by in-state buyers, proved ineffective. *Id.* The federal obligations and remedies created by the PACT Act were designed, in part, to provide a more effective remedy for such tax evasion.

Moreover, the transactions at issue in this case are by definition transactions *in interstate commerce*, an area in which Congressional jurisdiction is plenary. These considerations all support the contention made by the United States (Brief at pp. 30-31) that the PACT Act can be applied to delivery sellers who have minimum contacts with the United States.

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[32] PACT Act, P.L. 111-154;

II. Assuming, arguendo, the relevant sovereign is the State into which cigarettes are sold, a delivery seller of tobacco products has minimum contacts with the State.

A. Delivery sellers have purposefully availed themselves of benefits accorded by the States into which such sales are made.

Assuming, arguendo, that the relevant sovereign for purposes of determining whether minimum contacts exist is the state into which cigarettes are sold, a seller of goods has such contacts if it "purposefully avails itself of the benefits of an economic market in the forum state." *Quill Corp. v. North Dakota*, 504 U.S. 298 at 307 (1992). The Court of Appeals remanded the case to this Court to conduct a factual inquiry into whether the contacts of the delivery seller in this case with states into which it sold cigarettes were sufficient to constitute minimum contacts if it found that the state was the relevant sovereign.

The facts in this case demonstrate that Mr. Gordon purposefully availed himself of benefits accorded by the states into which he made delivery sales and that he received benefits from the enforcement of law by those states. Indeed, without taking advantage of the benefits accorded by those states, he could never have made such sales at all.

Delivery sellers of cigarettes such as Mr. Gordon deliberately choose the State into which sales are made and their product is consumed when they solicit business nationally, accept particular orders, and ship their product to a particular address; when they ship the product, they know that it will be consumed in a particular State. This is not a case in which a product is simply being launched into an undifferentiated stream of commerce and happens to be sold in a State.

In many states and localities the sale of tobacco products is heavily regulated. All states prohibit the sale of tobacco products to minors and many states and municipalities require

licenses for retailers to sell cigarettes.[33] Moreover, at the wholesale level, all States license distributors to sell cigarettes to retailers and to affix stamps evidencing the payment of applicable taxes.[34] In every state, an in-state retailer is prohibited from selling cigarettes on which state excise taxes have not been paid. These requirements, all of which apply to Mr. Gordon's competitors, create and regulate the market into which he seeks to sell cigarettes. In the absence of this pervasive system of state regulation that market would be far less accessible to delivery sellers.

At least eleven States have enacted statutes that prohibit non-face-to-face sales of cigarettes altogether or prohibit delivery sales by sellers such as Mr. Gordon, who are neither licensed retailers nor distributors licensed to affix tax stamps.[35] However, those States that continue to permit such sales have all enacted use taxes that complement such permission. In such States delivery sellers such as Mr. Gordon may continue to make such sales but customers resident in the State who purchase such unstamped cigarettes are required to pay a use tax equivalent to the excise tax imposed on sellers through the state tax stamp. The incidence of the use tax is on the purchaser. However, as noted above, the use tax is difficult to enforce and easy to evade. Therefore, the PACT Act conditions the right of a delivery seller who wishes to continue making such sales to take minimal measures designed to help the state ensure that the

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[33] American Lung Association, State Legislated Actions on Tobacco Issues ("SLATI"). http://www.lungusa.org/slati/.

[34] Three states—North Carolina, South Carolina and North Dakota—do not require distributors to affix revenue stamps but even these states require licensed distributors to pay the state excise tax.

[35] Arizona: A.R.S. § 36-798.06, § 42-3201(I), § 42-3208(F); Arkansas: A.C.A. § 26-57-203(26); Connecticut: C.G.S.A. § 12-285c; Maine: Me. Rev. Stat., tit. 22, § 1555-F; Maryland: MD. Bus. Reg. § 16-223; New York: McKinney's Public Health Law § 1399-11; Ohio: R.C. § 2927.023; South Dakota: SDCL 10-50-99, et seq.; Utah: U.C.A. 1953 §§ 59-14-509, 76-10.105.1; Vermont: 7 V.S.A. § 1010; Washington: R.C.W.A. Chapt. 70.155.

use tax is paid. The continued availability of this orderly, regulated and heavily-taxed market to Mr. Gordon and other delivery sellers is a substantial benefit. As the Supreme Court has observed, since the incidence of the State use tax is on the buyer, those who can sell unstamped cigarettes are marketing the ability to facilitate tax evasion by the buyers. *Moe v. Salish & Kootenai Tribes*, 425 U.S. 663, at 481-82 (1976). The higher the tax evaded, the greater the advantage it confers on such sellers.

The additional benefits conferred on delivery sellers by continuing to keep this market open are also substantial. A delivery seller may avail himself of the court system of state to enforce contractual agreements with consumers. Far more significantly, however, the state permits the delivery seller—by selling a product that causes death and disease—to impose huge health care costs thereby. While some such health care costs are ultimately borne by the state's citizens, many more are borne by the state or by the federal government. The health care and productivity cost of each pack of cigarettes is more than $20 per pack,[36] a figure substantially higher than the combined federal, state and local tax on cigarettes anywhere in the nation. Permitting the sale of cigarettes without requiring full payment of such costs confers a substantial benefit on sellers of those cigarettes. Finally, States and localities typically provide clean-up services for the nearly 300 billion non-biodegradable cigarette butts created each year

[36] 2014 Surgeon General's Report (p. 679). U.S. Department of the Treasury, U.S. Alcohol and Tobacco Tax and Trade Bureau (TTB), Tobacco Statistics, http://www.ttb.gov/tobacco/tobacco-stats.shtml. Total US cigarette sales in 2013 were 13.69 billion packs. TTB, http://www.ttb.gov/statistics/2013/201312tobacco.pdf.

in the United States. Clean-up and disposal of this toxic waste costs state and local governments millions of dollars annually and relieves the seller of any such obligation.[37]

A delivery seller of cigarettes to consumers in a state that permits such sales to be made therefore gains significant benefits from the state's policies. An obligation for such a seller to take reasonable steps to prevent consumers in the state from evading the state's use tax is therefore closely related to the benefits a delivery seller receives from access to customers in the state and "arise out of [and] . . . are connected to the activities within the state." *International Shoe Co. v. Washington*, 326 U.S. 310, at 319 (1945).

As noted above, State excise taxes account for a significant portion of the total retail price of cigarettes.[38] The State collects excise taxes on all cigarettes sold at retail in face-to-face transactions within the State and all cigarettes sold in such transactions are priced to reflect the payment of such taxes. A seller of cigarettes on which such taxes are not paid thereby gains a large competitive advantage: a market for his goods is created by virtue of his ability to price cigarettes without including such taxes. By imposing and collecting taxes on Mr. Gordon's competitors, the State creates the very price advantage without which Mr. Gordon would not have had a market. This advantage is particularly important in the deep discount segment of the

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[37] Schneider, John E., *et al.*, "Tobacco litter costs and public policy: a framework and methodology for considering the use of fees to offset abatement costs," *Tobacco Control* 20:i36-i41, 2011, http://tobaccocontrol.bmj.com/content/20/Suppl_1/i36.full.pdf+html.

[38] GAO, *Illicit Tobacco: Various Schemes Are Used to Evade Taxes and Fees*, Report No. 11-313, March 2011 (p. 10), http://www.gao.gov/new.items/d11313.pdf. For example, in New York City in 2011 taxes and fees accounted for 62% of the retail price of cigarettes.

cigarette market, the market targeted by sellers such as Mr. Gordon, in which customers are particularly likely to make purchasing decisions on the basis of price.[39]

In essence, the States into which Mr. Gordon sold cigarettes created the market for his cigarettes by enforcing their tax laws against in-state sellers. It is no accident that all six of the States into which Mr. Gordon sold cigarettes have excise taxes well above the national average and that the excise taxes of three of the six—New York, Rhode Island, and Massachusetts, rank first, second, and third in the country.[40]

Moreover, the record establishes that Mr. Gordon purposefully availed himself of the benefits accorded by the laws of states that permitted delivery sales of cigarettes. Mr. Gordon's website advertised that it "does not pay taxes on cigarettes and tobacco products" and declared that it would "pass this savings on to all of our customers nationwide.[41] The tax advantages cited by Mr. Gordon in promoting the sales of his cigarettes were the result of (1) state policy to continue permitting delivery sales to be made; (2) the States' enforcement of tax laws against in-state sellers; and (3) evasion of use tax by purchasers in delivery sales. Given Mr. Gordon's website advertising of tax advantages that are dependent on the evasion of such taxes and his direction of sales into states that continued to permit such sales, it is difficult to imagine a more "purposeful availment" of advantages conferred by a state.

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[39] Cornelius, Monica E., *et al.*, "Trends in the use of premium and discount cigarette brands: findings from the ITC US surveys (2009-2011)," *Tobacco Control* 23:i48-i53, March 2014, http://tobaccocontrol.bmj.com/content/early/2013/10/03/tobaccocontrol-2013-051045.full.pdf+html.

[40] Campaign for Tobacco-Free Kids, *State Cigarette Tax Rates & Rank, Date of Last Increase, Annual Pack Sales & Revenues, and Related Data*, June 20, 2014, http://www.tobaccofreekids.org/research/factsheets/pdf/0099.pdf.

[41] Declaration of Eric Proshansky, attachment to Memorandum of Amicus Curiae City of New York, Ex. 1, Oct. 8, 2014.

In addition, the record shows that Mr. Gordon's website was set up to direct sales into specific jurisdictions and preclude sales into others. Mr. Gordon's website advised customers to input their zip code in order to determine whether delivery sales could be made to them.[42] Such conduct is similar to that of the seller in *Illinois v. Hemi Group LLC*, 622 F.3d 754, 757-58 (7th Cir. 2010), in which the Seventh Circuit found that a seller had purposefully availed itself of the advantages afforded by the recipient state when it chose to sell to a customer in Illinois while declining to sell into New York, where such sale was arguably illegal.

Moreover, nothing in the evidentiary record indicates that Mr. Gordon's sales into any State were too minimal to provide a basis for the assertion of jurisdiction, particularly in light of Mr. Gordon's purposeful availment of the benefits accorded by the policies of the recipient states. (See Brief of the United States at 22-24). In a similar case arising under the Jenkins Act, the Seventh Circuit held that minimum contacts existed to give Illinois jurisdiction over an out-of-state delivery seller of cigarettes that had maintained a website that could be accessed by customers in Illinois and where a single delivery sale of cigarettes had been made to a customer in Illinois. *Hemi*, *supra*; see also, *McGee v. Int'l Life Ins. Co*, 355 U.S. 220 (1957) (holding that the issuance of a single life insurance policy by an out-of-state insurer to a resident of California was sufficient to confer jurisdiction on California courts); *Chloé v. Queen Bee of Beverly Hills, LLC*, 616 F.3d 158, 171 (2d Cir. 2010) (finding minimum contacts with a state into which there had been only a single sale of goods). However, whether or not a single sale of goods is sufficient to establish minimum contacts is irrelevant in this case because there is no assertion that jurisdiction over Mr. Gordon may be based on such limited sales.

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42 *Id*.

B. The sale of tobacco products into a State affects highly important State public health interests.

Because the products at issue are cigarettes and because the sale of cigarettes at prices that do not reflect state taxes subvert the public health interests of the recipient State, the effects of any such sales are profound. As noted above, States have instituted excise taxes and use taxes on cigarettes for public health purposes. The high excise taxes on cigarettes are among the most important elements in a State's public health program designed to deal with the consequences of the tobacco epidemic and youth addiction to tobacco. Sales of cigarettes at prices that do not reflect such taxes increase tobacco consumption and encourage youth access to tobacco products. Moreover, cigarettes sold without payment of taxes have an even greater effect because the availability of cigarettes at these prices requires competitors who pay the tax to lower their retail prices in order to compete. Thus, the sale of untaxed cigarettes ripples throughout the cigarette market. The effect of such sales extends far beyond the number of cigarettes that are actually untaxed.

As noted above, cigarette smoking is the largest preventable cause of death in the nation and actions that subvert State efforts to combat it have extremely significant effects on a State's interests. Moreover, the State's interest in preventing the sale of untaxed cigarettes is important because experimentation with cigarettes by underage smokers is so likely to lead to addiction and because the pricing of cigarettes is so critical to the level of youth usage. While the State's interest in protecting the lives of its children is paramount, sales of untaxed cigarettes also subvert important State interests by imposing health care costs on the States without any corresponding payment. If, as noted above, the economic cost of cigarette smoking is $289 billion per year, the per-pack health care costs of cigarette smoking amount to more than $20 per

pack.[43] There is not a single jurisdiction in the country where the combined State, federal and local taxes are that high. For cigarette sales in which taxes are paid, the State receives some compensation. Where no taxes are paid, sellers impose such costs on the States while enjoying a free ride at the State's expense.

Even beyond the health care costs directly caused by smoking, cigarettes impose huge clean-up costs on the States. The States must find a way to deal with 300 billion cigarette butts—nearly all of which are non-biodegradable and which may themselves be toxic.

III. This Court should not strike down the statute on its face.

Mr. Gordon does not merely seek to be relieved of the obligation to comply with the PACT Act if and when such obligations arise from delivery sales made to consumers in States with which he does not have minimum contacts; rather, Mr. Gordon seeks a ruling that would prohibit the enforcement of these provisions against any delivery seller, anytime, regardless of the contacts such seller may have with the jurisdiction. Even if one could conjure a situation in which a delivery seller's contacts with a jurisdiction might not meet the requirements for minimum contacts, it is a different matter entirely to prohibit the enforcement of the statute in any context whatsoever. Moreover, Mr. Gordon seeks such relief even though no enforcement action at all has been brought against him. For all the many good reasons set forth in the Opposition of the United States (Br. at 25-40), this Court should not grant this relief.

Plaintiff's motion (Br. at 20-21) purports to rely on *Quill Corp. v. North Dakota*, 504 U.S. 298 (1992) for the proposition that a state statute that did not explicitly require minimum contacts can be struck down on its face. However, *Quill* stands for precisely the opposite

[43] Supra, n. 36.

proposition. In conducting its analysis of minimum contacts under the due process clause, the Supreme Court not only considered the application of the state statute as applied to the particular seller, but after having done so it actually rejected the due process challenge altogether *as applied to Quill*. 504 U.S. at 308. Instead, *Quill* struck down the North Dakota statute on the ground that, in the absence of Congressional legislation permitting a state to impose such a requirement, a state statute impermissibly infringed Congress's plenary power to regulate interstate commerce. *Id.*at 312-19. By contrast, in this case, the statute plaintiff challenges was enacted by Congress in the exercise of its plenary power to regulate interstate commerce. Properly viewed, *Quill* is actually a demonstration that due process challenges based on lack of minimum contacts should be considered on an as-applied basis and not as facial challenges.

CONCLUSION

For the foregoing reasons, this Court should deny the relief sought by the plaintiff and dissolve the preliminary injunction.

Respectfully submitted,

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APPENDIX A

STATEMENTS OF INTEREST OF AMICI CURIAE

The American Cancer Society (ACS) conducted decades-long research that helped establish the scientific link between tobacco use and cancer. The **American Cancer Society Cancer Action Network (ACS CAN)** is the nonpartisan advocacy affiliate of ACS. With nearly one million advocates nationwide, ACS CAN works to eliminate cancer as a major health problem, including supporting effective tobacco control policies at the federal, state, and local levels.

The **American Heart Association** (AHA) is a voluntary health organization that, since 1924, has helped protect people of all ages and ethnicities from the ravages of heart disease and stroke. AHA is one of the world's premier health organizations, with local chapters in all 50 states, as well as in Washington D.C., and Puerto Rico. The association invests in research, professional and public education, and advocacy so people across American can live stronger, longer lives. AHA has long been active before Congress and regulatory agencies on tobacco and other health-related matters and has petitioned the Food and Drug Administration (FDA) on several occasions seeking regulation of cigarette and other tobacco products under the Federal Food, Drug, and Cosmetic Act.

The **American Legacy Foundation (Legacy)** envisions an America where tobacco is a thing of the past and where all youth and young adults reject tobacco use. Legacy was established in March 1999 as a result of the Master Settlement Agreement reached between the attorneys general in 46 states and five U.S. territories and the tobacco industry. Legacy's programs address the health effects of tobacco through counter-marketing and grass roots marketing campaigns, research, youth activism, grants, technical assistance and training, public education, and outreach to populations disproportionately affected by the toll of tobacco.

The A**merican Lung Association** is the nation's oldest voluntary health organization, with over 429,000 volunteers in all 50 states and the District of Columbia. Because cigarette smoking is a major cause of lung cancer and chronic obstructive pulmonary disease, the American Lung Association has long been active in research, education and public policy advocacy regarding the adverse health effects caused by tobacco use, as well as efforts to regulate the marketing, manufacture, distribution and sale of tobacco products.

The **Campaign for Tobacco-Free Kids** ("CTFK") is a non-profit organization that has advocated for nearly twenty years—in coordination with grassroots tobacco control organizations throughout the country—for effective tobacco control measures at the state, local and federal levels.

APPENDIX B

RELEVANT TEXT OF AUTHORITIES FOR WHICH NO LINK IS PROVIDED

Footnote Number	Author, Title	Appendix Pages
17	Chaloupka, Contextual factors and youth tobacco use: policy linkages Chaloupka, The taxation of tobacco products	1-3 4-39
23	Orzechowski & Walker, The Tax Burden on Tobacco	40-42
30	Jensen, Availability of tobacco to youth via the Internet Williams, Internet cigarette vendors' lack of compliance with a California state law designed to prevent tobacco sales to minors	43-44 45-46

Contextual factors and youth tobacco use: policy linkages

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ABSTRACT

This paper provides a short commentary on the set of papers contained in this special issue that discuss various contextual factors that affect youth smoking. It highlights the interrelationships between the economic and policy factors, media influences, community factors, peer influences and familial factors that impact on youth smoking. Particular emphasis is given to the direct effects of prices and policies on youth smoking, and to the indirect effects of these factors as they work through the other contextual factors.

KEYWORDS Cigarette price, contextual factors, control policies, youth smoking.

The collection of papers developed for this special issue of *Addiction* provides a unique perspective on the variety of contextual factors that can affect youth tobacco use, ranging from the macro-level policy and media influences, to more localized community, peer, and family factors. As is well discussed in the paper by Wilcox (2003), the variations that we observe in youth smoking rates across states and communities clearly reflect the importance of these contextual factors in explaining youth smoking, with some of these factors directly affecting behavior and others indirectly affecting it, with both the direct and indirect effects moderated by the individual youth's own characteristics.

Each of the contextual factors that is described in the various papers—economic and policy factors, media influences, community factors, peer influences and familial factors—works in combination with the others. This is perhaps clearest in the case of the price and policy issues reviewed by Liang and colleagues (Liang *et al.* 2003). As she describes, there is substantial research on the impact of prices, taxes, smoke-free air laws, limits on youth access to tobacco products and other tobacco control efforts on youth smoking. These analyses, however, do not disentangle the direct and indirect mechanisms through which these factors influence youth smoking, but rather look at their net impact.

As Liang *et al.* review, many studies conclude that increases in cigarette taxes and prices lead to significant reductions in youth smoking, with the higher prices effective in reducing youth smoking initiation (particularly the initiation of more regular smoking), encouraging smoking cessation and reducing cigarette consumption among young smokers. These effects are likely to be the result of a variety of mechanisms through which higher prices influence the variety of contextual factors that relate to youth smoking. Those who have studied this issue, however, have not disentangled these mechanisms, in large part because of the lack of detailed data on the multiple pathways through which price can affect youth smoking behavior.

For example, higher cigarette prices can impact on some youth experimentation with cigarettes by influencing smoking among parents and other family members. As discussed in the papers by Darling & Cumsille (2003) and Avenevoli & Merikangas (2003), many studies have documented the linkages between parental and/or sibling smoking and youth smoking. While part of these linkages is accounted for by genetic factors, another part is likely to be the result of environmental factors, including the more ready availability of cigarettes to youth in families where other family members smoke and the modeling of smoking by parents, older siblings and other family members. Anecdotal evidence suggests that many young smokers' first experiences with cigarettes involve cigarettes that were taken from family members, while research evidence clearly indicates the importance of accessibility and

availability in youth smoking initiation and uptake (US Department of Health & Human Services 1994). Higher cigarette prices can reduce the availability of cigarettes to youth through family sources by causing parents or other family members who smoke to quit, by making them more aware of their 'supply' of cigarettes and more likely to notice missing cigarettes, or by leading them to switch to lower priced, less appealing brands of cigarettes. Similarly, to the extent that higher prices promote smoking cessation among parents and other family members, there will be fewer models for potential young smokers.

Similarly, as Kobus (2003) describes clearly, numerous empirical studies from multiple disciplines have identified peer influences as a major factor in youth smoking initiation and uptake. Economists have argued that one of the reasons for the greater sensitivity of youth smoking to price is the importance of peer influences (Chaloupka & Warner 2000). That is, as some youth are deterred from smoking by higher prices, other youth will be discouraged from smoking because of the reductions in smoking among their peers.

Again, the effects of price on youth smoking that work through peers can occur through multiple channels. Clearly, the reductions in smoking among peers and the impacts on youth norms concerning smoking are the most direct. In addition, higher prices can reduce the availability of cigarettes through social sources, which have become increasingly important to youth in recent years (Jones *et al.* 2002). This reduced availability can result from both fewer young smokers having cigarettes to share and of those who have them being less willing to give them away because of their higher costs of obtaining them.

This reduced availability in response to higher prices can also occur at the community level. Higher prices may lead local cigarette vendors to be less likely to make cigarettes available for self-service, so as to minimize their loss from shoplifting, a small, but not trivial source of cigarettes, particularly for younger smokers (Jones *et al.* 2002). Unpublished data from over 14 000 retail stores observed from 1999 to 2001 collected in the ImpacTeen project provide some support for this, with cigarettes less available for self-service in stores with higher cigarette prices. In addition to reducing availability for theft, eliminating self-service cigarette availability can also make the purchase experience more difficult for youth, deterring some from smoking, and may also help to reduce the pervasiveness of cigarette advertising and promotion in retail stores which can further lower youth smoking. As Wakefield and colleagues note (Wakefield *et al.* 2003), tobacco company advertising and promotion at the point-of-purchase and elsewhere can have a significant impact on youth smoking decisions.

Many other tobacco control policies, particularly those that impact on broad populations, are likely to have similar direct and indirect effects on youth smoking that work through families, peer groups, community institutions, and other contextual factors. Strong, comprehensive smoke-free air laws can promote cessation among adults, reduce cigarette consumption among those who continue to smoke and create strong social norms against smoking. These public policies can stimulate action among local businesses, retailers, community organizations and others, leading them to adopt private policies regulating smoking in their workplaces, restaurants, malls, recreation facilities and other community venues frequented by youth. In other cases, it works in reverse, with the action in the private sector leading to the adoption of public policies [as Pollack & Jacobson (2003) point out, the political economy of youth smoking regulation is a complex process influenced in different ways by multiple interest groups]. Either way, these changes can lead to reductions in youth smoking initiation, uptake and cigarette consumption. Moreover, the spread of these public and private policies, accompanied by the dissemination of information on the harmful effects of exposure to second-hand smoke, particularly for children, can lead parents—including many smoking parents—to make their homes smoke-free, reducing youth smoking further.

In contrast to policies such as increased excise taxation, comprehensive smoke-free air laws and broad-based counter-advertising campaigns and comprehensive tobacco control programs, all of which have demonstrated effectiveness in significantly reducing youth smoking, policies that target narrower segments of the population or a particular aspect of smoking behavior are likely to have less of an impact, in large part because they fail to work through many of the direct and indirect channels described above. This is perhaps most true of the policies that limit youth access to cigarettes for which, as Liang and colleagues describe, there is mixed evidence of effectiveness in reducing youth smoking. For these policies to have any impact, retailers must be highly compliant with them. Some analysts have suggested (DiFranza 2000; for example) that compliance needs to be very high (perhaps 90% or more) and widespread before youth smoking will be affected. Achieving compliance rates above this threshold is likely to be very difficult and would require strong institutional support through aggressive enforcement and strong penalties, as well as strong community support so as to raise the likelihood that retailers would not sell to minors.

If retailers were highly compliant with these policies, the availability of tobacco products to youth through commercial sources would be greatly reduced, but overall availability would be much less affected. Cigarettes could still be stolen from parents and other older family members, shoplifted from stores, obtained using false

proof of age, by having someone of age buy and, perhaps most importantly, from older peers who could purchase them legitimately. Recent data clearly indicate a shift among young smokers away from reliance on commercial sources for cigarettes to reliance on other sources, particularly giving money to someone else to buy, suggesting that the policies limiting youth access are less than effective.

As the collection of papers prepared for this special issue demonstrates clearly, youth smoking initiation and uptake is a complex process that is influenced by a wide range of contextual factors, including policies aimed at reducing smoking. Substantial research clearly demonstrates the effectiveness of some of these policies—those that can affect youth smoking in a number of contexts—in reducing youth smoking. The impact of those policies that take a more narrow approach, targeting a particular dimension of youth smoking, is less clear. More research on these contextual factors, particularly research that cuts across several of them from a transdisciplinary perspective, is needed in order to better understand the complexities of the uptake process and to formulate more effective policy and other approaches to reducing youth smoking.

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10
The taxation of tobacco products

Frank J. Chaloupka, Teh-wei Hu, Kenneth E. Warner, Rowena Jacobs, and Ayda Yurekli

This chapter reviews a variety of issues related to the taxation of cigarettes and other tobacco products. The empirical evidence showing that higher cigarette taxes result in higher cigarette prices is reviewed. This is followed by a discussion of the econometric literature examining the impact of prices and taxes on the demands for tobacco products. The small but growing body of research for low-income and middle-income countries clearly shows that higher prices would lead to significant reductions in tobacco use. Similarly, numerous studies from high-income countries reach the same conclusion. The estimated price-elasticities for low-income and middle-income countries are about double those for high-income countries, where estimates center on –0.4. Because of the addictive nature of tobacco use, demand for tobacco products is more elastic in the long-run. In addition, estimates from high-income countries indicate that youth and young adults, less educated persons, and those with lower incomes will be relatively more responsive to price changes. This review is followed by a discussion of the various motives for tobacco taxation, including the use of these taxes to generate revenues and to improve economic efficiency and public health. Finally, several other issues in tobacco taxation, including the earmarking of tobacco tax revenues and barriers to tobacco taxation, are discussed.

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**. . . . In the mean time the people might be relieved from some of the most burdensome taxes; from those which are imposed either upon the necessaries of life, or upon the materials of manufacture. The labouring poor would thus be enabled to live better, to work cheaper, and to send their goods cheaper to market. The cheapness of their goods would increase the demand for them, and consequently for the labour of those who produced them. This increase in the demand for labour, would both increase the numbers and improve the circumstances of the labouring poor. Their consumption would increase, and together with it the revenue arising from all those articles of their consumption upon which the taxes might be allowed to remain.

(Smith, 1776, Book V, Chapter III, pp. 474–476.) (Emphasis added.)

10.1 Introduction

Shortly after Columbus returned to Europe bringing tobacco from the New World with him, tobacco use was subject to much controversy. Indeed, a number of countries soon

adopted laws prohibiting the sale of tobacco and/or its public use, while others described tobacco as a 'social menace'—among the more severe penalties for selling and/or consuming tobacco products were whippings, beheadings, and nose slittings in Russia, China, Turkey, India, and elsewhere (Wagner 1971; Dillow 1981). However, it was not long before these laws were repealed as treasuries realized that significant revenues could be generated from the sale and taxation of tobacco and tobacco products. For centuries, nearly every country in the world has taxed tobacco and/or tobacco products, largely because the relatively inelastic demands for these products make them an easy source of revenues. Over time, however, as the health consequences of cigarette smoking and other tobacco use were discovered, increased taxation of these products has been used, by at least some governments, as a way of reducing the health damage caused by tobacco.

This chapter reviews a variety of issues related to the taxation of cigarettes and other tobacco products, beginning with a review of the economics literature on the impact of tobacco taxation on price and the subsequent effects of prices on the demands for cigarettes and other tobacco products. The various rationales for tobacco taxation, including those related to revenue generation, equity, and as a means to improve public health, are then discussed. Issues related to the design and administration of tobacco taxes are covered elsewhere (Chapter 17).

10.2 The impact of tobacco taxes on the prices of tobacco products

Increases in taxes on cigarettes and other tobacco products are expected to result in higher prices for these products. This is clearly reflected by the data in Table 10.1, which describes cigarette taxes, prices, and taxes as a percentage of price in selected countries. As expected, prices generally rise with taxes. In general, taxes in low- and middle-income countries are well below taxes in high-income countries; consequently cigarette prices in low- and middle-income countries are well below prices in high-income countries. Moreover, the cigarette tax usually accounts for two-thirds or more of price in higher-income countries (with the notable exception of the United States), compared to half or less of the price in many low- and middle-income countries.

When specific excise taxation (based on quantity) is the primary form of taxation, the real value of the tax will fall over time, unless regularly increased to account for inflation. Given that taxes are important components of the prices of tobacco products, one consequence of using specific excise taxes is that the real prices of tobacco products will decline over time as the prices of other goods and services increase more rapidly. In the United States, for example, the relative stability of federal and state cigarette excise taxes in the 1970s contributed to a drop of nearly 40% in real cigarette prices between 1971 and 1981 that was reversed by a series of federal and state tax increases in the 1980s and 1990s. In contrast, under a system that primarily uses *ad valorem* taxation (based on value), the real value of the tax and the real price of tobacco products will likely be stable over time as nominal prices rise with the prices of other goods and services.

Table 10.1 Cigarette prices and taxes, selected countries, by income group

	Price (US$)	Tax (US$)	Tax as percentage of price
Low-income countries			
Armenia	0.20	0.10	50
Bangladesh	0.09	0.03	30
Cambodia	0.05	0.01	20
China	0.20	0.08	38
India (white sticks)	0.37	0.28	75
Pakistan	0.28	0.21	73
Sri Lanka	1.05	0.25	24
Vietnam	0.10	0.04	36
Zambia	0.65	0.20	30
Zimbabwe	0.43	0.34	80
Lower-middle-income countries			
Albania	0.29	0.20	70
Bolivia	0.32	0.20	61
Bulgaria	0.60	0.25	42
Colombia	0.06	0.03	45
El Salvador	0.67	0.28	42
Indonesia	0.0004	0.0001	30
Jamaica	0.37	0.16	42
Philippines	0.22	0.14	63
Thailand	0.60	0.37	62
Turkey	0.51	0.22	42
Venezuela	0.07	0.04	50
Upper-middle-income countries			
Argentina	1.38	0.97	70
Brazil	1.05	0.79	75
Chile	0.88	0.62	70
Czech Republic	0.33	0.0003	0.1
Hungary	0.52	0.22	42
Malaysia	0.68	0.23	33
Mexico	0.63	0.38	60
Poland	0.50	0.20	39
Slovak Republic	0.58	0.20	34
Slovenia	1.08	0.68	63
South Africa	1.32	44	33
High-income countries			
Australia	4.85	3.15	65
Austria	2.96	2.16	73
Belgium	3.32	2.49	75
Canada	3.98	2.04	51
Denmark	5.21	4.38	84
Finland	4.49	3.28	73
France	2.90	2.17	75
Germany	3.38	2.43	72
Greece	1.90	1.39	73
Ireland	1.69	1.27	75

Table 10.1 (*Cont.*)

	Price (US$)	Tax (US$)	Tax as percentage of price
Italy	2.19	1.60	73
Japan	2.43	1.46	60
Korea, Republic of	0.77	0.46	60
Netherlands	2.99	2.15	72
New Zealand	4.69	3.19	68
Norway	7.01	5.47	78
Portugal	1.47	1.19	81
Spain	1.38	0.99	72
Sweden	4.58	3.16	69
Switzerland	2.80	1.45	52
United Kingdom	4.16	3.24	78
United States	1.94	0.58	30

Source: unpublished data, World Bank.

In a perfectly competitive market with constant long-run costs of production, an increase in tobacco taxes would be fully passed on to consumers in the form of an equivalent price increase. At the opposite extreme, a private monopolist would share the burden of the tax increase with smokers, with consumers bearing relatively more of the burden when demand is relatively inelastic. In the past, a single firm dominated the tobacco industry in many countries; in some countries, the government was the monopolist. Over time, however, with increasing trade liberalization and the growth of multinational tobacco companies, this has changed (as described in Chapter 14). As shown by Jacobs *et al.* (Chapter 13), the tobacco industry in nearly every country is at neither extreme, but is instead an oligopoly. The oligopolistic nature of the tobacco industry in most countries has significant implications for the effects of tobacco tax increases on the prices of tobacco products.

Nearly all of the empirical analyses of the relationship between tobacco taxes and prices are based on data for cigarettes from the United States. The earliest studies produced generally inconsistent findings, with some concluding that price increased by less than the amount of a tax increase (consistent with monopoly behavior), while others concluded that the tax increase was fully passed on to consumers (consistent with more competitive behavior) (Barzel 1976; Johnson 1978; Sumner 1981; Sumner and Ward 1981; Bulow and Pfleiderer 1983; Bishop and Yoo 1985; Sullivan 1985; Sumner and Wohlgenant 1985; Ashenfelter and Sullivan 1987). One general weakness of these studies is that they failed to account for the dynamic interaction of firms in an oligopolistic industry, a factor that has become increasingly important in recent years as the growth of multinational tobacco companies has led to greater competition in once monopolized markets and increased consolidation in markets that were once relatively more competitive.

More recent studies have attempted to more formally model the dynamic nature

of an oligopolistic industry when estimating the impact of cigarette taxes on cigarette prices. Models of oligopoly behavior, however, have less clear implications for the effects of tax increases on price. Those in which there is relatively little collusion among firms, for example, suggest that increases in taxes would be at least partially borne by tobacco firms. Those where there is more coordinated behavior, however, could result in price increases of the same or greater magnitude than the tax increase. Historically, there is consistent evidence of collusive behavior among tobacco firms (although it falls short of perfectly collusive, or monopoly, behavior). For example, internal industry documents recently uncovered as part of Washington state's lawsuit against US tobacco companies suggest that Philip Morris and British American Tobacco (the two largest multinational tobacco companies) colluded to fix cigarette prices and divide markets in Costa Rica, Argentina, Venezuela, and other Latin American countries (Levin 1998). The collusion was not perfect, however; for example, one British American Tobacco memo suggests that a price war in Venezuela resulted when smuggled cigarettes became more common.

Most of the more recent empirical studies of the tax-price relationship that have modeled the dynamic, oligopolistic behavior of tobacco companies conclude that increases in cigarette taxes lead to significant increases in cigarette prices. Harris (1987), for example, used data on wholesale and retail cigarette prices, as well as data on manufacturing costs and state cigarette taxes, to estimate the impact of the doubling of the US federal cigarette tax (from 8 to 16 cents per pack) in 1983 on US cigarette prices. He concluded that the tax increase led to a price increase that was more than double the size of the tax hike (17 cents), which could not be explained by increases in manufacturing costs. Harris argued that firms in the US cigarette market used the scheduled tax increase as a coordinating mechanism for an oligopolistic price increase, noting that the price increases began shortly after the tax increase was announced, but well before the tax was actually increased.

This issue was re-examined by Barnett and his colleagues (1995), who argued that Harris attributed too much of the price increase to the tax increase, noting that the underlying upward trend in cigarette prices predated the debate over the US tax increase. Instead, they argued that the introduction of generic cigarettes in 1981 was used as the mechanism for coordinated, oligopolistic increases in the prices of premium cigarettes. The lower-priced, lower-quality generic cigarettes kept at least some of the more price-sensitive smokers in the market.

In a series of papers, Keeler and his colleagues (Sung *et al.* 1994; Barnett *et al.* 1995; Keeler *et al.* 1996) explored the relationship between state and federal cigarette tax increases and cigarette prices. Their models accounted for the interaction of supply and demand, the oligopolistic nature of the cigarette industry, and, in some cases, the addictive nature of cigarette smoking. Using annual, state-level data for the period from 1960 through 1990, Keeler *et al.* (1996) estimated that a 1-cent increase in a state's cigarette tax would lead to a 1.11-cent increase in the state's average cigarette prices. Moreover, they estimated that a national tax increase would lead to an even larger increase in price. The relatively smaller increase in state prices was attributed to the potential for cross-border shopping for cigarettes in nearby lower tax and price states. In addition, Keeler and his colleagues concluded that cigarette producers price-

discriminate by state. That is, cigarette producers charge relatively low prices in states where there are stronger state and local tobacco control policies than they do in places with weaker policies. However, they noted that the effect of this price discrimination on retail prices was relatively small.

In addition, recent theoretical advances in the modeling of addictive behavior also imply that increases in tobacco taxes will lead to disproportionate increases in the prices of tobacco products. Becker *et al.* (1994) describe the behavior of a monopolist producing an addictive good like cigarettes. They argued that the monopolist will set a price below the short-run profit-maximizing level when consumption is addictive and future prices will exceed future marginal costs because of their monopoly power. The lower price 'hooks' consumers on their addictive product, thus raising the future demand for this product. When cigarette taxes are increased, Becker *et al.* argued that cigarette companies will raise price by more than the amount of the tax increase in order to obtain the maximum profits from current, addicted smokers. The increase in current profits helps them offset the future losses from the reduced smoking initiation that results from the tax and price increase. Becker and his colleagues explained this apparent paradox as follows (1994, p.413):

> If smokers are addicted and if the industry is oligopolistic, an expected rise in future taxes and hence in future prices induces a rise in current prices even though current demand falls when future prices are expected to increase.

The key conclusion to draw from both the empirical and theoretical research is that increases in cigarette and other tobacco taxes, because of the addictive nature of consumption and because of the oligopolistic structure of the industry, will lead to increases in the prices of tobacco products that are likely to match or exceed the increase in the tax in most countries. Relatively larger increases in prices will occur in countries where there is less potential for cross-border shopping (i.e. relatively low tax-and-price countries surrounded by relatively high tax-and-price countries).

10.3 Tobacco taxes, prices, and the demands for tobacco products

10.3.1 Theoretical foundations

Perhaps the most fundamental law of economics is that of the downward-sloping demand curve derived from the consumer's constrained utility-maximization process. This law states that as the price of a product rises, the quantity demanded of that product falls. For many years, however, numerous researchers viewed cigarette smoking and other addictive behaviors as exceptions to this most basic law of economics because of the seeming irrationality of these behaviors (i.e. Schelling 1978, 1984; Elster 1979; Winston 1980). A now substantial and rapidly expanding literature, however, clearly indicates that the demands for tobacco products do respond to changes in prices and other factors. This is apparent from the simple descriptive data presented in Figs 10.1–10.3, as well as from the econometric research that has applied both traditional models of demand and the more recent studies that explicitly account for the addictive nature of cigarette smoking and other tobacco use (see Chapter 5 for a detailed discussion of the economics of addiction).

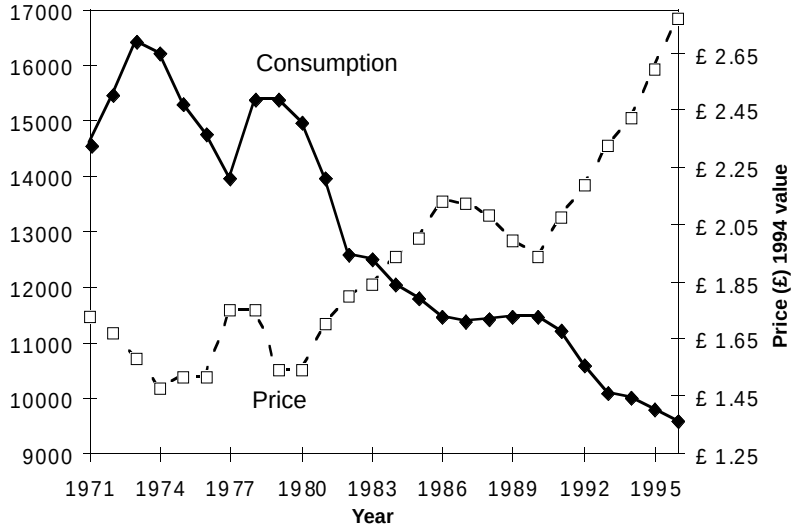

Fig. 10.1 Real cigarette prices and cigarette consumption, United Kingdom, 1971–96. (Source: Townsend 1998.)

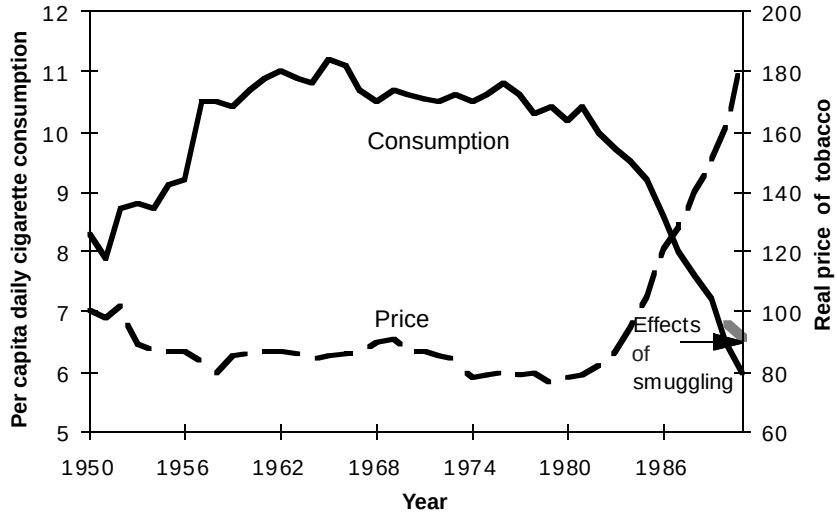

Fig. 10.2 Real cigarette prices and daily per capita cigarette consumption among persons 15 and older, Canada 1950–91. (Source: Townsend 1998.)

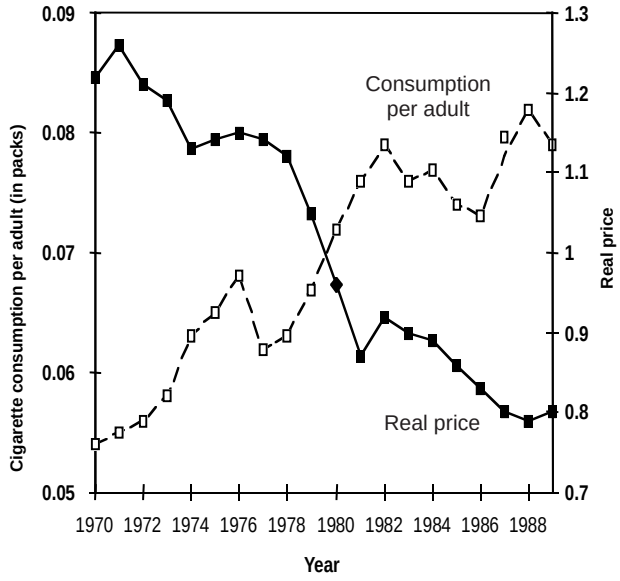

Fig. 10.3 Real cigarette prices and cigarette consumption, South Africa, 1970–89. (Source: Townsend 1998.)

10.3.2 Estimation issues

Over the past several decades, numerous studies have examined the effects of taxes and prices on the demands for cigarettes and other tobacco products. Most of the earliest involved applications of a traditional model of demand, but many of the more recent studies have modeled the addictive nature of tobacco use. These studies have employed diverse econometric and other statistical methods on data from numerous countries. Many have used aggregate time-series data on cigarette sales for a single geographical unit, while others have employed pooled cross-sectional time-series data. Still others have used data on individuals taken from surveys. One clear conclusion emerges from this literature: increases in the prices of cigarettes and other tobacco products significantly reduce cigarette smoking and other tobacco use. Most estimates for the price-elasticity of demand from the large literature on high-income countries fall into the relatively narrow range from – 0.25 to – 0.50, with many clustering around – 0.40. In contrast, estimates from the much smaller literature on low-income and middle-income countries suggest that demand in these countries is more responsive to price than demand in high-income countries, with most estimates in the range from – 0.50 to – 1.00.

Several difficulties are likely to be encountered by researchers when using aggregate data to estimate the demand for cigarettes. In a time-series model, the estimated price and income elasticities of demand will be sensitive to the inclusion of variables controlling for the effects of other important determinants of smoking, including advertising, changes in existing policies for reducing tobacco use, and increased awareness of the health consequences of smoking. High correlations among these variables

can lead to unstable estimates for the parameters of interest. However, excluding potentially important variables that are correlated with those that are included can lead to biased estimates of the included variables. Many of the studies discussed below, however, have used state-of-the-art methods for time-series to address these difficulties. In general, the aggregate measures of cigarette consumption reflect tax-paid cigarette sales rather than actual consumption. When cross-border shopping and smuggling are important, sales are likely to understate consumption in relatively high tax-and-price jurisdictions, while overstating consumption in relatively low tax-and-price jurisdictions. If these factors are not controlled for, then estimates of the effects of taxes and prices on demand based on sales data are likely to overstate the impact of price on cigarette smoking. However, many of the recent studies employing aggregate data have made careful efforts to allow for cross-border shopping and organized cigarette smuggling; although imperfect, these efforts should significantly reduce the biases associated with the use of sales data as the measure of consumption. An additional problem in the analysis of aggregate data arises from the fact that cigarette prices are determined by the interaction of supply and demand. Failing to account for this simultaneity leads to biased estimates of the price-elasticity of demand. Again, several recent studies have theoretically and empirically modeled the supply and demand for cigarettes. Alternatively, others have taken advantage of natural experiments (such as large increases in cigarette taxes) to avoid the simultaneity problem. Finally, studies employing aggregate data are limited to estimating the impact of changes in prices and other factors on aggregate or per capita estimates of cigarette consumption. Consequently, these studies cannot provide information on the effects of these factors on the prevalence of tobacco use, initiation, cessation, or quantity and/or type of tobacco product consumed. Similarly, these studies cannot explore differences in responsiveness to changes in price and other factors among different population subgroups, including those defined by age, gender, race/ethnicity, and socio-economic status.

The use of individual data taken from surveys avoids some of the problems associated with the use of the aggregate data. For example, the data collected in the surveys provide measures of the prevalence of tobacco use and consumption of tobacco products, avoiding some of the difficulties associated with using sales data as a proxy for consumption. Similarly, many of the key determinants of tobacco use at the individual level are likely to be much less correlated with one another than comparable aggregate measures, creating fewer estimation problems and likely resulting in more stable parameter estimates. Likewise, because individual smokers' purchase decisions are too small to affect the market price of cigarettes, the use of individual-level data is not as likely to be subject to the simultaneity problems inherent in the use of aggregate data. The use of individual-level data, particularly longitudinal data, also allows researchers to explore issues that are difficult to adequately address with aggregate data, including the separate effects of price and other factors on the prevalence of tobacco use, frequency and level of tobacco consumption, initiation, cessation, and type of product consumed, as well as the differential effects among population subgroups. However, the use of individual-level data is not without its own problems. These data may be subject to a significant ecological bias to the extent that omitted variables affecting tobacco use may be correlated with the included determinants of demand. Excluding these variables will, consequently, produce biased estimates for the included variables.

In addition, the use of individual-level data is subject to potential reporting biases; the potential under-reporting of tobacco consumption can lead to problems in interpreting the estimates that are produced from these data. In general, studies using individual-level data have implicitly assumed that the degree of under-reporting is proportional to the actual level of use, implying that the estimated effects of price and other factors will not be systematically biased. Finally, one of the limitations of using survey data is that data on price, availability, advertising, policies, and other important, macro-level determinants of demand, are generally not collected in the surveys. As a result, many relevant variables may be omitted from the analysis, while others added from archival sources may be subject to measurement errors.

10.3.3 Estimates from low-income and middle-income countries

A small but growing number of studies have examined the demands for cigarettes and other tobacco products in a few low- and middle-income countries, while new research is beginning to focus on others. Warner (1990) argued that economic theory suggests that demand in these countries is likely to be more sensitive to price than demand in more affluent countries given the relatively low incomes in these countries. Similarly, the economic models of addiction suggest that the generally lower level of education in lower-income countries is likely to make the demand for tobacco products in these countries relatively more responsive to changes in monetary prices than demand in higher-income countries. In general, the findings from these studies are consistent with these hypotheses, suggesting that cigarette demand in lower-income countries is two or more times as sensitive to price as demand in higher-income countries.

Chapman and Richardson (1990) were the first to empirically estimate the impact of tobacco taxes on the demands for cigarettes and other tobacco products in a developing country. Using annual data on the weight of cigarette and non-cigarette tobacco consumed in Papua New Guinea for the period from 1973 through 1986, they estimated excise tax elasticities of –0.71 for cigarettes and –0.50 for other tobacco products. Their relatively simple double-log regression analysis modeled each of the measures of tobacco use as a function of the excise tax on cigarettes, the excise tax on other tobacco products, income, and a time trend. In addition to the strong own-tax effects that they estimated, Chapman and Richardson also found significant cross-tax effects. Their estimated cross-tax elasticity of cigarette consumption, with respect to other tobacco taxes, was 0.50, while that for other tobacco consumption with respect to the cigarette tax was 0.62. Their estimates clearly indicate that cigarettes and other tobacco products are substitutes for one another. That is, an increase in the cigarette tax, all else constant, would reduce cigarette smoking in Papua New Guinea, with much of the reduction in cigarette tobacco consumption offset by an increase in other tobacco consumption. In addition, Chapman and Richardson found strong, positive income effects for both types of tobacco products.

As Warner (1990) and the authors note, their tax elasticity will understate the true price-elasticity of demand given that taxes are less than 100% of price. Assuming that the tax is fully passed on to consumers, the price-elasticity of demand will be directly related to the inverse of the share of tax in price. For example, if half of price is accounted for by the tax, then the price-elasticities of cigarette and other tobacco

demands in Papua New Guinea would be –1.42 and –1.00, respectively. Unfortunately, the authors' efforts to obtain information on the relationship between taxes and prices were 'fruitless'. Nevertheless, their estimates provided the first evidence that the demand for tobacco products in low-income countries was more responsive to price than demand in high-income countries.

Tansel (1993), however, reached the opposite conclusion for Turkey, a lower-middle income country. Using annual time-series data on cigarette consumption per adult over 15 for the period from 1960 through 1988, Tansel estimates a series of double-log models that include cigarette prices, income, and an indicator for the period when health-warning labels were required on cigarette packages. Additional specifications include an indicator for the years when anti-smoking media campaigns were in place, measures of secondary and higher education enrollment, and/or a measure of lagged consumption (consistent with assuming myopically addictive behavior). He found a negative and significant effect of price on cigarette demand in all specifications. The average short-run price-elasticity of demand implied by the alternative estimates was –0.21. Moreover, lagged cigarette consumption had a positive and significant impact on current consumption, consistent with the assumption of addictive behavior. As expected, the estimated long-run price-elasticity of demand (– 0.37) was well above the short-run estimates. In addition, Tansel found a strong positive effect of income on cigarette demand in Turkey, as well as negative and significant effects for the various indicators for health information and education.

Several recent studies provide some estimates on the price-elasticity of cigarette demand in China (Mao *et al.* 1997; Mao and Xiang 1997; Hsieh and Hu 1997; Xu *et al.* 1998). These estimates, in a range centering on – 0.75, are consistent with the hypothesis that cigarette demand in China is relatively more responsive to price than demand in most developed countries. The first, by Mao and his colleagues (1997), used annual time-series data from the Sichuan province for the period from 1981 to 1993 to estimate the price-elasticity of cigarette demand. Their time-series model included the price of cigarettes, personal disposable income, and per capita alcohol consumption. Two alternative specifications, one including a time-trend variable and one excluding it, were estimated using weighted least squares methods; both produced significant estimates for the cigarette price variable. Based on these results, Mao and his colleagues estimated that the price-elasticity of cigarette demand was in the range from – 0.656 to – 0.803. In contrast to trends in developed countries, the coefficient on their time-trend variable was positive and significant, indicating that cigarette smoking in Sichuan was increasing during the period covered by their data. In addition, Mao *et al.* also estimated models accounting for the addictive nature of cigarette consumption, producing estimated long-run price-elasticities of –1.03 and –1.32 from models that assumed myopic and rational behavior, respectively. Given these estimates, and information on the share of cigarette taxes in price, the authors concluded that raising cigarette taxes in China would lead to both significant reductions in smoking and large increases in cigarette tax revenues.

In a follow-up study, Mao and Xiang (1997) used a cross-sectional survey of 2431 adults in the Sichuan province to estimate a two-part model of cigarette demand. Cigarette price data were collected at the retail level based on the survey respondents' location. They estimated a price-elasticity for smoking participation of – 0.89 and a conditional demand elasticity of – 0.18. These estimates imply that sizable increases in

Chinese cigarette taxes would lead to sharp reductions in smoking prevalence among adults.

Hsieh and Hu (1997) produced similar estimates for Taiwan using annual time-series data for the period from 1966 through 1995. The authors estimated several alternative specifications, including one that allowed for the potential endogeneity of price and another allowing for myopically addictive behavior. In addition to price, their models included income, the market share of low tar cigarettes (which they interpret as reflecting the spread of information about the health consequences of smoking), an indicator for the time when strong health warning labels were required, the female labor force participation rate, and the market share of imported cigarettes (to capture the effects of the opening of the Taiwanese cigarette markets in the late 1980s, described in more detail by Taylor *et al.* in Chapter 14). In addition to estimating overall cigarette demand, Hsieh and Hu separately estimated the demands for domestically produced and imported cigarettes. In all equations, they found strong negative and significant price effects, with estimated price-elasticities of demand from the various specifications in the range from – 0.5 to – 0.7. In addition, they found that the demand for imported cigarettes was much more price sensitive than the demand for domestic brands, with a price-elasticity for imports of –2.7, and that Taiwanese smokers viewed domestic and imported cigarettes as substitutes for one another. In addition, they conclude that both increased income and the opening of the Taiwanese cigarette markets led to an increase in demand, while new information on the health consequences of smoking reduced demand. Similarly, current smoking was found to be positively related to past consumption, consistent with myopic addiction. Finally, they noted that their estimates clearly imply that higher cigarette taxes (which they point out are low in Taiwan compared to most developed countries) are an important policy tool for reducing cigarette smoking in Taiwan.

Most recently, Xu *et al.*(1998) estimated the demand for cigarettes in China using annual time-series data for the period from 1978 through 1992. As the authors described, the data limitations that are typical for many empirical studies are particularly severe for low-income countries, including China. The authors begin their analysis with 1978, since prior to that government control of the cigarette markets in China was very tight and the price of cigarettes was largely fixed. After 1978, however, cigarette prices were allowed to vary, enabling them to conduct an econometric analysis of demand. In addition to estimating the impact of prices on demand, the authors estimated the effects of cigarette taxes on demand in models that also include a measure of per capita income and a time-trend variable. They found that both higher cigarette taxes and prices lead to a significant reduction in per capita cigarette consumption. They estimate a price-elasticity of demand of – 0.987. Their estimate of the tax elasticity of demand, – 0.57, is very consistent with this given the share of taxes in cigarette prices in China and the assumption that taxes are fully passed on to smokers. Xu and his colleagues used their estimates to compute the revenue maximizing value of the tax and the optimal tax in China, concluding that the actual tax was well below both of these.

Studies conducted as part of the Economics of Tobacco Control Project (ETCP) at the University of Cape Town's School of Economics project provide estimates of the price-elasticity of cigarette demand for other low-income countries (Maranvanyika

1998; van der Merwe 1998). As part of this project, researchers estimated the demand for cigarettes in South Africa in a series of alternative specifications that modeled the simultaneity of cigarette demand and supply, as well as the addictive nature of cigarette smoking. In addition to price and income, these models included measures of cigarette advertising, an indicator for years when anti-smoking advertising was broadcast, and unemployment and divorce rates. Using sophisticated econometric methods applied to annual time-series data for the period from 1970 through 1994, the ETCP estimated that the short-run price-elasticity of demand for cigarettes in South Africa was – 0.59. In addition, they estimated a long-run price-elasticity of demand of – 0.68 in their empirical application of a rational addiction model; their estimates, however, did not support the hypothesis of rational addiction. Similarly, the ETCP researchers employed a similar approach to estimate the demand for cigarettes in Zimbabwe using annual time series data for the period from 1970 through 1996. Data limitations, however, required them to estimate a relatively lean specification that included cigarette price, income, and lagged consumption. Based on this model, the researchers concluded that the price-elasticity of demand for cigarettes in Zimbabwe was – 0.85, well above most estimates from high-income countries. Costa e Silva (1998) provided similar estimates for Brazil in a study presented at the ETCP's 1998 Cape Town conference. Using the very limited annual data available for the period from 1983 through 1994, she applied the rational addiction model in an econometric examination of cigarette demand in Brazil. Her estimates from these very limited data indicate that higher cigarette prices would lead to significant reductions in cigarette demand, with a long-run price-elasticity of demand of – 0.80, well above the short-run estimate of – 0.11. However, given the rational addiction model's demands on the very limited data, these should be viewed as a suggestive rather than definitive estimates of the magnitude of the effect of price on demand in Brazil.

One clear conclusion emerges from the econometric studies of the effects of prices on the demands for tobacco products in low- and middle-income countries: higher taxes on cigarettes and other tobacco products would lead to significant reductions in cigarette smoking and other tobacco use. This finding is consistent with a fundamental principle of economics—the law of the downward-sloping demand curve—as well as with the substantial body of research from higher income countries discussed in the next section. In addition, the estimates from low- and middle-income countries suggest that demand in these countries is relatively more responsive to price than demand in high-income countries. Estimates of the price-elasticity of demand for China (including Taiwan), Turkey, Papua New Guinea, and South Africa fall in the relatively wide range from – 0.1 to –1.0 (or higher, given the tax elasticity estimated for Papua New Guinea), with most in the range from – 0.5 to –1.0, while those from higher income countries tend to fall in the range from – 0.25 to – 0.5. This difference in relative price sensitivity is consistent with standard economic theory that suggests that price sensitivity will be greater among those with lower incomes as well as the economic theories of addictive behavior that suggest that less educated, lower income persons will be more responsive to changes in monetary prices than those with more education and higher incomes.

In addition, these studies suggest two interesting, policy relevant conclusions. First, they suggest that cigarettes and other tobacco products are substitutes for one another.

Increases in the prices of one type of cigarettes, for example, will lead to reductions in the consumption of that type of cigarettes that will be partially offset by increases in consumption of other types of cigarettes as well as other tobacco products. Second, the estimates that have attempted to account for addiction provide mixed support for the hypothesis of rational addiction, but are more generally supportive of myopic addiction. This implies that the long-run reductions in cigarette smoking and other tobacco use resulting from a price increase will exceed the short-run effects.

10.3.4 Estimates from high-income countries

In contrast to the relatively small number of studies for low- and middle-income countries, there is a large and growing body of research on the demands for cigarettes and other tobacco products in high-income countries, including the US, Canada, the UK, Ireland, Finland, Austria, Switzerland, other Western European countries, Australia, New Zealand, Japan, and others. Many have used aggregate time-series data comparable to that used in the studies from low- and middle-income countries described above, although the time-period covered in the studies for high-income countries is typically much longer than that for the studies of low- and middle-income countries. Many others have employed pooled cross-sectional times-series data for countries (i.e. OECD countries) or political divisions within a country (i.e. the states of the United States). Still others have employed individual-level data taken from surveys within a given country. Most of the early studies ignored the impact of addiction on the demands for tobacco products; several of the more recent studies, however, do account for the addictive nature of smoking and other tobacco use.

In general, the studies from high-income countries are consistent with those from low- and middle-income countries, in that they find strong and consistent evidence that increases in the prices of cigarettes and other tobacco products will lead to significant reductions in cigarette smoking and other tobacco use. The studies from high-income countries produce estimates of the price-elasticity for overall cigarette demand that fall in a relatively wide range, but most fall in the relatively narrow range from – 0.25 to – 0.5 (for more detailed reviews, see: US Department of Health and Human Services 1989, 1992, in press; and Chaloupka and Warner, in press). In addition, the studies from high-income countries have addressed a number of issues that, to date, it has not been possible to address in the studies for low- and middle-income countries given the limitations of the data on cigarette smoking and other tobacco use in these countries. These findings, and their implications for the effects of tobacco taxes and prices in low- and middle-income countries are the focus of this section.

A relatively small, but growing number of cigarette-demand studies have used data on individuals taken from large-scale surveys (mostly from the US). In general, the price-elasticities of demand estimated in these studies are very consistent with those obtained in studies that employ aggregate data. Because of their use of individual-level data, however, these studies are able to address issues that can not be addressed with aggregate data; most importantly, they can provide separate estimates of the impact of price on the prevalence of cigarette smoking and other tobacco use, and the conditional demands for cigarettes and other tobacco products (the consumption of these products conditional on being a consumer). In general, most of the recent studies that

used individual-level data on cigarette smoking have concluded that half or more of the effect of price on cigarette demand is on smoking prevalence; the remainder of the effect is on cigarette consumption by continuing smokers (i.e. Lewit and Coate 1982; Mullahy 1985; Wasserman *et al.* 1991; Chaloupka and Grossman 1996; US Centers for Disease Control and Prevention 1998). For example, a recent study by the US Centers for Disease Control and Prevention (CDC 1998) that used data from 13 large population surveys conducted from 1976 through 1993, estimated a prevalence elasticity of cigarette demand of – 0.15 and an overall demand elasticity of – 0.25. The same pattern is likely to apply in low- and middle-income countries; that is, approximately half of the impact found in the studies using aggregate data described above is likely to be on smoking prevalence. Given the epidemiological evidence on the health consequences of tobacco use and the benefits of cessation (Chapter 2), this implies that significant increases in cigarette and other tobacco taxes would lead to substantial reductions in the morbidity and mortality resulting from tobacco use.

In addition, a number of studies have employed aggregate and individual-level data from a variety of countries to estimate cigarette demand in the context of myopic and rational addiction models (Young 1983; Mullahy 1985; Baltagi and Levin 1986; Pekurinen 1989, 1991; Chaloupka 1991; Becker *et al.* 1994; Conniffe 1995; Duffy 1996; Cameron 1997; Bardsley and Olekalns 1998). In general, these models provide strong support for the hypothesis that cigarette smoking is an addictive behavior, based on their findings that higher past consumption has a positive and significant impact on current cigarette smoking. In contrast, the estimates from these studies provide mixed support for the hypothesis of rational addiction. In general, estimates from studies for the US (Chaloupka 1991; Keeler *et al.* 1993; Becker *et al.* 1994; Sung *et al.* 1994), Finland (Pekurinen 1991), and Australia (Bardsley and Olekalns 1998) are inconsistent with myopic addiction, although the relatively high discount rates implied by some estimates are not consistent with fully rational behavior. Estimates for the UK (Duffy 1996), Greece (Cameron 1997), and Ireland (Conniffe 1995), however, generally provide little support for the rational addiction model; the relatively small number of observations available for their analyses and the use of several highly correlated regressors, however, generally limit these studies. As discussed above, the key implication of applications of the economic models of addiction to the demands for tobacco products is that demand will adjust slowly to changes in price. These studies consistently produce estimates of the long-run price-elasticity of demand that are about double that obtained for the short-run. The key policy implication of this is that the impact of tax increases that result in sustained increases in the real prices of cigarettes and other tobacco products will grow over time. As a result, the long-run health benefits of higher tobacco taxes will be larger than the more immediate benefits (Townsend 1993).

Several recent studies from the US have used individual-level data to explore differences in the price-elasticity of cigarette demand by age, with a particular emphasis on youth and young adults given that most smoking initiation takes place during the teenage years and becomes firmly established during young adulthood. Grossman and his colleagues (Lewit *et al.* 1981; Grossman and Chaloupka 1997) have suggested that younger persons would be more sensitive than older persons to changes in cigarette prices for several reasons. First, given the addictive nature of cigarette smoking, they

argued that youth who had been smoking for a relatively short time would be likely to adjust more quickly to changes in price than long-term, more addicted adult smokers. Second, peer smoking has a much greater impact on youth smoking than it does on adult smoking, implying a multiplicative effect of price on youth smoking. That is, an increase in cigarette price directly reduces a given youth's smoking and then indirectly reduces it by lowering peer smoking. Third, the fraction of disposable income a young smoker spends on cigarettes is likely to exceed that spent by an adult smoker; economic theory implies that this will make youth smokers more responsive to price. Finally, compared to adults, youth are likely to be more present-oriented. In the context of the economic models of addiction, this implies that a change in the monetary price of cigarettes will have a greater impact on youth smoking than it will for adults.

The earliest research on this issue supported the hypothesis that younger persons would be more responsive to changes in cigarette prices than older persons. Lewit and his colleagues (Lewit *et al.* 1981; Lewit and Coate 1982) concluded that there was an inverse relationship between price-elasticity and age, with teenagers up to three times more sensitive to price than adults. A decade later, however, Wasserman and his colleagues (1991), Chaloupka (1991), and Townsend and her colleagues (1994) concluded that youth and young adults were not significantly more responsive to cigarette price changes than were older adults. A number of recent US studies, however, based on several large, nationally representative surveys, have supported Lewit and his colleagues' findings of an inverse relationship between price and age (Chaloupka and Grossman 1996; Chaloupka and Wechsler 1997; Lewit *et al.* 1997; Evans and Huang 1998; Tauras and Chaloupka 1999; CDC 1998). Chaloupka and Grossman (1996), for example, used data on over 110 000 eighth-, tenth-, and twelfth-grade students to examine the effects of price and a variety of tobacco control policies on youth smoking. They estimated an overall price-elasticity of demand for youth smoking of –1.31, concluding that just over half of the effect of price was on youth smoking prevalence. Similarly, the CDC's estimated price-elasticity of cigarette demand by young adults (– 0.58) was more than double their overall estimate (– 0.25). These results have important implications for low- and middle-income countries where youth smoking prevalence has been increasing in recent years (see Chapter 2). Given that tobacco use among youth is relatively more responsive to price and that most smoking initiation occurs before age 20, significant increases in tobacco taxes in developing countries would be effective in producing long-run reductions in smoking in all segments of the population.

In general, researchers examining the effects of price on smoking prevalence using individual level data have assumed that the impact of higher prices in reducing smoking prevalence reflects reduced smoking initiation among youth and increased smoking cessation among adults. A few recent studies have attempted to address these issues more directly. Douglas (1998) and Douglas and Hariharan (1994), for example, applied hazard methods to retrospective data on smoking initiation taken from two large US surveys to estimate the impact of price on smoking decisions in the context of the Becker and Murphy (1988) model of rational addiction; Douglas (1998) was able to do the same for smoking cessation. Both studies found little evidence that higher prices reduced smoking initiation. However, as the authors noted, the errors-in-variables problems associated with both the retrospective data on smoking initiation

and the cigarette price data biased their estimates for price towards zero. Two recent studies using data from a longitudinal survey of youth in the US produce mixed evidence on this issue (DeCicca *et al.* 1998; Dee and Evans 1998). DeCicca and his colleagues concluded that higher cigarette prices have little impact on smoking initiation, while Dee and Evans estimated price effects consistent with those obtained in the recent studies based on cross-sectional data described above. Differences in variable construction and the treatment of missing data account for the differences in findings between the two studies. In contrast to the findings for initiation, Douglas (1998) did find strong evidence that higher prices reduced the duration of smoking, with an estimated price-elasticity of –1.0; that is, he concluded that an increase of 10% in price would reduce the duration of smoking by approximately 10%. Clearly, more research using appropriate longitudinal data is needed before rejecting the consistent findings from recent studies based on the cross-sectional survey data.

Several recent studies suggest important differences in the price sensitivity of demand among different socio-economic groups. The US Centers for Disease Control and Prevention (1998), for example, concluded that US Hispanics and Blacks were much more sensitive to price than were White non-Hispanics; Chaloupka and Pacula (1999) found similar differences among black and white youths. To the extent that socio-economic status is correlated with race and ethnicity in the United States, these findings suggest that people on lower incomes may be more sensitive to price. More compelling evidence resulted from the CDC's (1998) separate estimates of cigarette demand by low- and high-income persons in the United States. They estimated that the price-elasticity of cigarette demand by persons at or below the median family income in their sample was over 70% larger than their estimate for persons in families above the median. Chaloupka's (1991) finding, in the context of the rational addiction model, that less educated persons were relatively sensitive to price, while more educated persons were generally insensitive to price, is consistent with the hypothesis that there is an inverse relationship between the price-elasticity of cigarette demand and income. Townsend and her colleagues (1994) provided additional support for this hypothesis. Using data from the British General Household Survey, they concluded that people in the highest socio-economic groups were relatively unresponsive to price, while those in the lowest socio-economic groups were very responsive to price. These findings are consistent with the discussion above comparing the estimates obtained from low- and middle-income countries to those from high-income countries, and provide additional support for the contention that proportionate increases in the prices of tobacco products would have a larger impact on tobacco use in low- and middle-income countries than they would in high-income countries.

Finally, several studies from a variety of countries have examined the impact of taxes and prices on other tobacco products on the demands for these products, generally producing results consistent with the estimates from studies of cigarette demand (Thompson and McLeod 1976; Pekurinen 1989, 1991; Leu 1984; Ohsfeldt and Boyle 1994; Chaloupka *et al.* 1997; Oshfeldt *et al.* 1997, 1999). In addition, these studies generally found evidence that cigarettes and other tobacco products are substitutes for one another, consistent with the conclusion suggested above for developing countries. Similarly, recent work by Evans and Farrelly (1998) concluded that increases in cigarette taxes lead to compensating behavior by smokers. Using data from the United

States, they found that smokers in high-tax states were more likely to smoke longer cigarettes and/or higher tar and nicotine cigarettes, potentially offsetting some of the health benefits of the higher taxes. Similar substitution away from manufactured tobacco products that are more easily subjected to taxation and other regulation towards other more difficult to tax/regulate products (such as *bidis* in SE Asia) might also result from increases in taxes. The main policy implication of these findings is that comparable increases in the taxes on all tobacco products, and differential treatment of products epidemiologically proven to by more harmful, are likely to be needed to maximize the health benefits associated with increased tobacco taxation.

10.4 Motives for tobacco taxation

Cigarettes and other tobacco products have long been taxed in nearly every country around the world. As the introductory quotation highlights, even those who least support government intervention in the marketplace have supported the taxation of tobacco products as an easy source of revenues that imposes relatively few distortions. More recently, as the information on the health consequences of tobacco use has expanded, tobacco taxes have been seen as an appropriate 'user's fee' that covers the social costs of tobacco use, and as a powerful tool for improving public health. Nevertheless, proposed increases in tobacco taxes raise a host of philosophical and practical questions. This section reviews the theoretical and empirical evidence from the economics literature relevant to addressing many of these questions.

10.4.1 Tobacco taxation and revenues

The primary historical motivation, and still the most common rationale for tobacco taxation, is its revenue-generating potential. While tobacco tax revenues have historically accounted for as much as 3–5% of total government revenues in many high-income countries, their importance has generally declined over time. In contrast, tobacco tax revenues account for a significant share of total government revenues in many upper middle-income countries, but are relatively less important in most lower income countries (see Table 10.2).

A fundamental principle related to the efficiency of taxation is that taxes which generate substantial revenues, while minimizing the welfare losses associated with the higher prices resulting from the taxes, are preferable to those that result in greater welfare losses. As the so-called 'Ramsey Rule' dictates for consumption taxes (Ramsey 1927), the level of taxes will be inversely related to the price-elasticity of demand (holding the supply elasticity constant). Thus, goods with relatively inelastic demands should be taxed more heavily, while those with relatively elastic demands should be taxed least.

Given the evidence described above, cigarettes and other tobacco taxes appear to satisfy the Ramsey Rule. In the short-run, at least, the demand for tobacco products is relatively inelastic in most countries. Thus, increases in the taxes on tobacco products, even though they lead to significant reductions in cigarette smoking and other tobacco use, will at the same time lead to significant increases in tax revenues. This is in large

Table 10.2 Tobacco tax revenues as a share of total government revenues, selected countries

	Percentage of total government revenues accounted for by tobacco taxes
Low-income countries	
China	9.05
India	1.81
Nepal	5.40
Zimbabwe	1.04
Lower-middle-income countries	
Bulgaria	2.80
Colombia	0.73
Costa Rica	1.35
Egypt	0.78
Estonia	1.15
Upper-middle-income countries	
Argentina	4.00
Brazil	4.88
Chile	3.38
Greece	7.72
High-income countries	
Australia	3.04
Denmark	1.73
Finland	1.73
Spain	2.20
United Kingdom	2.98
United States	0.41

Source: World Bank.

part why institutions such as the International Monetary Fund have viewed increased tobacco taxes favorably (Sunley 1998).

For example, consider South Africa, where the long-run price-elasticity of cigarette demand was estimated to be – 0.68 and where taxes account for almost 40% of price. Assuming that an increase in cigarette taxes is fully passed on to consumers, and that the long-run price-elasticity of demand is constant, a permanent doubling of the South African cigarette tax would reduce cigarette demand by over 27% in the long-run, while raising cigarette tax revenues by nearly 50%. This positive relationship between cigarette taxes and cigarette tax revenues is clearly shown in Figs 10.4–10.6 that plot real cigarette taxes and cigarette tax revenues over time for the United States, South Africa, and Zimbabwe.

In general, the revenue-generating potential of cigarette and other tobacco taxes will be highest where the demands for these products is more inelastic and/or where taxes as percentages of prices are relatively low. Given the available estimates, there is ample

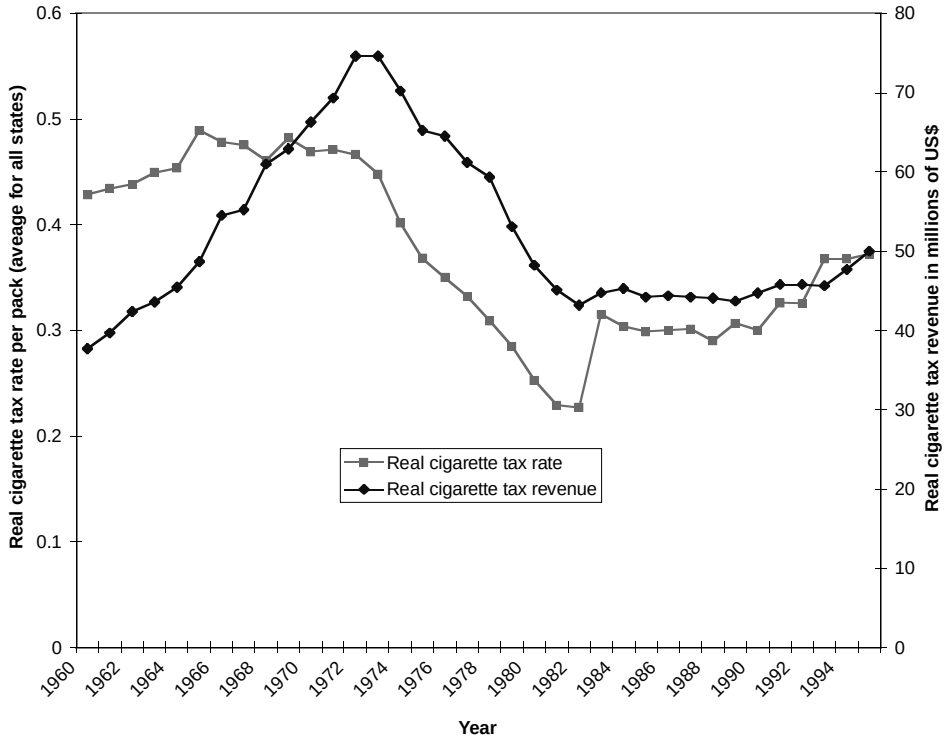

Fig. 10.4 Cigarette tax rate and cigarette tax revenue in the US 1960–95.

room for most countries to raise cigarette and other tobacco taxes, and at the same time generate additional revenues from these taxes. Consider China, for example, where estimates of the short-run price-elasticity of demand for cigarettes range from – 0.65 to –1.00. Assuming the low-end elasticity of – 0.65, a cigarette tax increase that led to a 10% increase in Chinese cigarette prices would result in a 6.5% reduction in cigarette sales, while total sales revenues would rise by 2.9% (Hu 1997). With an effective tax rate of 38% in 1992, these estimates imply that cigarette tax revenues would rise by 18.2%. On the other hand, assuming the price-elasticity of demand was constant at –1.00 and that a tax increase would be fully passed on to smokers, Hu (1997) estimated that a doubling of the Chinese cigarette tax would reduce cigarette consumption by nearly 40%, while raising cigarette tax revenues in China by approximately 20%. Given that cigarette-tax revenues in China account for about 9% of total revenues, Hu concluded that cigarette taxes are a very important government fiscal instrument (see Chapter 17 for a similar exercise for 70 countries and additional discussion).

To summarize, given the relative inelasticity of the demands for cigarettes and other tobacco products, tobacco taxes appear to satisfy the Ramsey Rule. That is, they generate substantial revenues in the short-run, while having a relatively small impact on social welfare. Moreover, given the share of taxes in prices, these taxes are likely to be

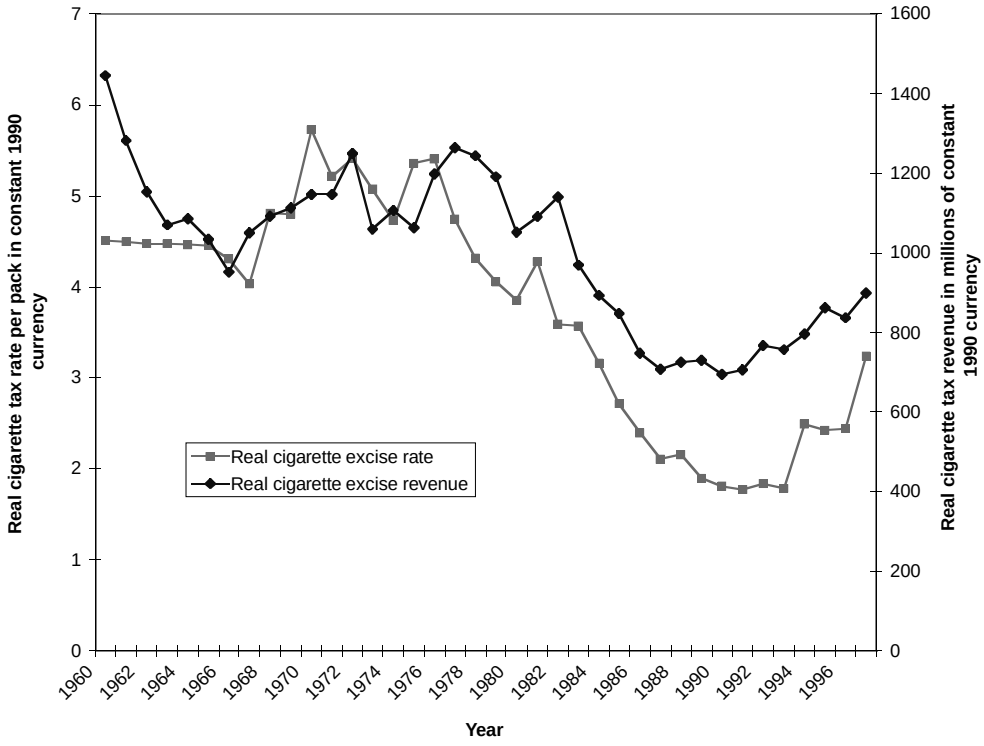

Fig. 10.5 Real cigarette tax rate and real cigarette tax revenue in South Africa 1960–97.

well below their revenue maximizing levels in most countries, including nearly all low- and middle-income countries.

10.4.2 Fairness standards

Debates over the appropriate level of tobacco taxes will necessarily encompass issues of equity and efficiency. With respect to equity, the focus has been on issues related to vertical equity—specifically on the apparent regressivity of cigarette and other tobacco taxes—and the 'benefit principle' of taxation. With respect to efficiency (aside from the efficiency arguments embedded in the Ramsey Rule), the focus has been on the use of tobacco taxes to cover the net social costs of cigarette smoking and other tobacco use. Each of these issues is discussed in more detail below.

Vertical equity

A basic principle of tax policy is the notion of vertical equity, which suggests that individuals with the greatest ability to pay should be taxed more heavily. This notion is reflected, for example, in progressive income tax systems where marginal tax rates rise as incomes rise. Cigarette and other tobacco taxes, however, appear to violate this

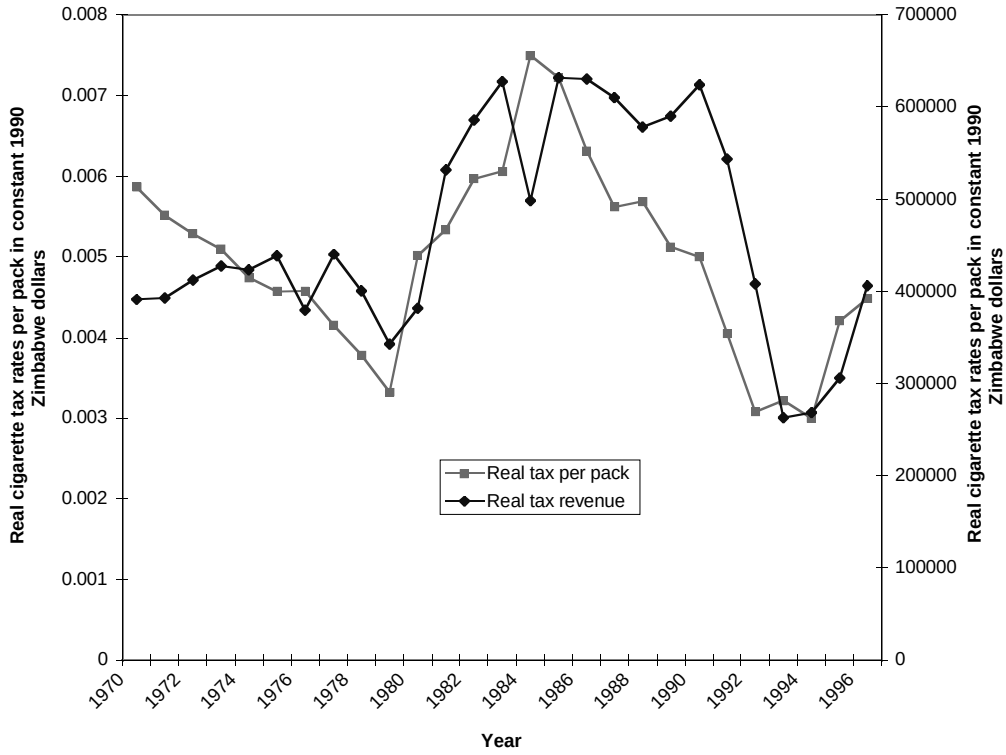

Fig. 10.6 Real cigarette tax rates and real cigarette revenue in Zimbabwe 1960–97.

principle. These taxes would be regressive with respect to income if the consumption of tobacco products was the same for both more affluent and poorer individuals. An additional concern in tax policy is the principle of horizontal equity, which implies that all individuals should be treated equally. Clearly, tobacco taxation violates this principle, since otherwise identical people who consume different quantities of tobacco products will be taxed differently.

In high-income countries, where tobacco use tends to be inversely related to income in recent years, the apparent regressivity of tobacco taxes is exacerbated. In most low- and middle-income countries, where tobacco consumption often rises with income, the regressivity of the taxes is less severe, although tobacco taxes as a share of income or total expenditures generally rises in these countries as income falls (see Chapter 3 for a more detailed discussion of the relationship between tobacco use and income in low-, middle- and high-income countries).

As discussed earlier, several recent studies found an inverse relationship between the price-elasticity of cigarette demand and socio-economic status (Chaloupka 1991; Townsend *et al.* 1994; CDC 1998). These estimates suggest that even though cigarette taxes may fall most heavily on lower income smokers, increases in these taxes may be progressive given the significantly larger reductions in smoking that occur among lower income smokers in response to a tax increase. Consider the following simple example.

Assume there are two smokers consuming the same number of cigarettes (x), one with relatively low income (y) and the second with relatively high income (3y). As implied by estimates of the price-elasticity of demand for different income groups, assume that the low-income smoker is relatively more price-sensitive (elasticity of – 0.80), while the high-income smoker is less price-sensitive (elasticity of – 0.20). Finally, assume that the cigarette tax is 50% of price (treat price per cigarette as the numeraire; i.e. p = 1) and assume that a tax increase is fully passed on to smokers. Given this, both pay x/2 in cigarette taxes; for the low-income person, this is x/2y of income as compared to x/6y for the high-income person. This tax is clearly regressive. However, the same is not true for a tax increase. Doubling the cigarette tax, assuming constant price-elasticities of demand, will reduce both smokers' cigarette consumption, with a relatively larger reduction for the lower income smoker. In addition, the total tax paid by both smokers will rise (to 0.6x/y for the low-income smoker and 0.3x/y for the high-income smoker). However, the increase in the tax paid by the low-income smoker is 0.1x/y, while that for the high-income smoker is 0.133x/y. Thus, while the existing tax may be regressive, a tobacco tax increase may be progressive and the overall regressivity of the tobacco tax will be reduced.

Moreover, given the estimated differences in the price-elasticity of demand by income, the health benefits resulting from tax-induced reductions in smoking would be disproportionately larger in the lowest income populations. Particularly appropriate would be the earmarking of new tobacco tax revenues to subsidize the provision of nicotine-replacement products and other smoking-cessation services for the poor, further reducing the perceived regressivity of a tax increase and increasing the progressivity of the health benefits from a tax increase (see Chapter 12 for more on this issue).

Finally, as has been pointed out by a number of analysts, the tax systems of most countries are a mix of many different taxes, where the overall goal of the taxation and expenditure system is to be progressive or proportional, even though specific elements of the system may be regressive (US Congressional Budget Office 1990; Warner *et al.* 1995). Increased progressivity of other tax and transfer programs could be used to offset the potential regressivity of tobacco tax increases. This is clearly the case when new tobacco tax revenues are earmarked for programs targeting low-income populations, including many of those discussed below that have used tobacco taxes to subsidize the provision of healthcare to low-income individuals.

The 'benefit principle'

The 'benefit principle' of taxation states that individuals should pay for their use of government-provided services in proportion to the benefits they derive from consuming these services. This notion is reflected in petroleum taxes and highway tolls that are then dedicated to financing road maintenance and construction. Thus, the taxes serve as 'user fees' that are paid roughly according to an individual's level of use. For cigarettes and other tobacco products, this concept is tied to the tobacco user's consumption of publicly funded healthcare to treat the consequences of his or her cigarette smoking and/or other tobacco use, as well as the use of other publicly funded services associated with tobacco use.

The direct application of the benefit principle to tobacco taxes will clearly depend

on the mix of publicly versus privately provided healthcare and other services and the impact of cigarette smoking and other tobacco use on the costs of these services. These issues are discussed extensively by Lightwood *et al.* in Chapter 4. In addition, the notion of tobacco taxes as user fees is inextricably tied to issues concerning the negative externalities associated with tobacco use. These issues are discussed in the following section on the economic efficiency of tobacco taxes.

10.4.3 Economic efficiency and tobacco taxes

Two notions of economic efficiency are important when discussing the appropriate levels of tobacco taxes. The first, discussed above, is reflected in the Ramsey Rule. That is, given that governments need to generate revenue and that consumption taxes are to be used for this purpose, taxes that are applied to goods and services with relatively inelastic demands will be more efficient than taxes applied to those with more elastic demands (holding the elasticity of supply constant). Given the estimates from the econometric studies of tobacco demand, tobacco taxes appear to be 'efficient' taxes, at least in the short run and in most countries.

A second notion of economic efficiency relates to the issue of externalities. This concept implies that individuals should bear the full costs of their consumption. When one individual's consumption imposes costs on others (a negative externality), others are paying part of the burden of that individual's consumption. Pigou (1962) has suggested that taxes could be used to improve economic efficiency in this situation. The Pigovian tax that would raise the tobacco user's marginal cost to the point where it was equal to the marginal social cost of tobacco use would produce an economically efficient outcome. Consequently, estimates of the net social costs of tobacco use are critical in determining the appropriate level of tobacco taxes. As Cook and Moore (1993) note, however, taxes that equated the user's marginal cost with the social marginal cost, for some goods, could generate tax revenues that exceed the net social cost, since the efficient tax would be based on marginal rather than average external costs.

Estimating the costs of the negative externalities resulting from cigarette smoking and other tobacco use is a highly controversial subject. In general, these externalities fall into two categories:

(1) the financial externalities associated with the impact of tobacco use on the costs of healthcare, group health and life insurance, pensions, and other collectively financed programs; and
(2) the costs associated with the health and other consequences of exposure to environmental tobacco smoke (ETS).

There is an abundance of evidence on the health consequences of tobacco use that clearly implies that the direct medical care costs of preventing, diagnosing, and treating tobacco-related diseases are substantial. (See, for example, the discussion of the health consequences of tobacco use in Chapter 2, as well as that on the impact of tobacco use on health systems costs in Chapter 4.) In addition, some have argued that the indirect morbidity and mortality costs associated with the lost earnings from work loss attributable to tobacco use should also be included when calculating the social costs of tobacco use. In general, these costs are included in most calculations of the

costs of smoking. In contrast, there are a number of costs that are typically not included, including the treatment of burn victims from smoking-related fires, the short-term healthcare costs and longer-term developmental costs associated with maternal smoking during pregnancy, the costs of treating illnesses related to exposure to ETS, intangible costs of tobacco-attributable morbidity and mortality (that is, the pain and suffering associated with the illness and the grief experienced by family and friends), and the annoyance costs of exposure to ETS.

Even if all of these costs were included in the calculus, the economist attempting to compute the net social costs of cigarette smoking and other tobacco use would face a number of challenges. First, one must determine an appropriate approach to valuing the life-years lost as a result of tobacco use, as well as which of these should be included in the computations. Most studies have taken a human capital approach to valuing life-years, an approach that critics argue significantly understates the value of a life. Using even relatively conservative figures for the value of a life-year, obtained from a willingness-to-pay approach, will significantly increase the estimates of the indirect costs of tobacco use. In addition, most studies of net social costs treat the indirect morbidity and mortality costs for tobacco users as internal costs, while the comparable costs from exposure to environmental tobacco smoke are more appropriately treated as external costs.

Similarly, only the healthcare and other costs that are not covered privately would be included as social costs in the conventional economist's accounting framework. In most high-income countries, where a substantial portion of healthcare is publicly provided, the social costs from treating tobacco-related illnesses will be substantial. In many low- and middle-income countries, however, where there is less publicly provided healthcare, and where the health consequences of smoking and other tobacco use are only beginning to appear, these costs will be modest. They will, however, grow over time as public insurance programs are adopted and as the health toll from tobacco grows. Moreover, even if there were no changes in public insurance, tobacco use would impose a significant social cost as a result of the increased demand for healthcare to treat tobacco-related illnesses, driving up the costs of all medical care, including that consumed by people who do not consume tobacco products.

A more difficult conceptual issue relates to determining whether or not the effects of an individual's tobacco use on his or her spouse and children should be included as an internal or external cost. Many of the economic studies on the social costs of smoking treat the family as the decision-making unit, with the earliest studies assuming that all of the health consequences of ETS exposure occurred within the family (i.e. Manning *et al.* 1991). Given the assumption that the family is the decision-making unit, the health consequences of a child's exposure to environmental tobacco smoke produced by parents' smoking would be considered an internal rather than external cost. Although many economists would accept treating the health costs of spouses as internal costs, there is considerable debate on applying this approach to fetuses and children who are relatively powerless to alter parents' consumption decisions that affect their health (see Chapter 7 for further discussion). Moreover, the disease and developmental problems associated with fetal and infant exposure to tobacco smoke have support costs that spill over into the broader society, as public institutions in many societies pick up part of the medical, institutional, and other costs related to these

problems. Similarly, as information on the health consequences of ETS exposure has increased, it has become clear that many of these costs are external to the family.

A more controversial question concerns the inclusion of transfers in the calculations of external costs. These transfers include the reduction in income taxes and insurance premiums paid by tobacco users because of reduced earnings associated with tobacco-related illnesses, the value of public and private retirement pensions foregone because of tobacco-attributable premature deaths, higher healthcare costs paid by public and private insurance plans that result from treating illnesses related to tobacco use, and the increased sick pay and disability benefits paid during these illnesses. Particularly objectionable to many is the idea that foregone public and private pension benefits should be considered a 'benefit' to non-tobacco users in the computation of the social costs of tobacco use. In high-income countries, where publicly financed retirement programs are important, the inclusion of the 'benefits' from tobacco-attributable premature death significantly reduces the estimates of the net social costs of tobacco use (i.e. Shoven *et al.* 1989; Manning *et al.* 1991; Viscusi 1995). In contrast, in most low- and middle-income countries, where old-age expenses are largely a private matter, the inclusion of these 'benefits' would have little impact on the estimated social costs.

As this discussion clearly demonstrates, the calculation of the 'true' net social costs of tobacco use is an exceedingly difficult challenge that involves difficult conceptual questions, epidemiologic and other data considerations, and moving targets in terms of both knowledge and institutional structures. More research is clearly required, particularly for low-income and middle-income countries, given the relevance of this task to determining economically efficient levels of tobacco taxes.

10.4.4 Public health standards

As the review of the studies on the demands for tobacco products clearly demonstrated, increases in the taxes on and prices of these products lead to substantial reductions in cigarette smoking and other tobacco use. These reductions are not limited to reductions in the frequency or quantity of tobacco products consumed, but also include reduced initiation among youth and young adults, and increased cessation among adults. Given the substantial health consequences of tobacco use and the significant health benefits from cessation (see Chapter 2 and Chapter 12), millions of premature, tobacco-related deaths could be averted by large increases in cigarette and other tobacco taxes.

The econometric evidence on the direct relationship between higher tobacco taxes and the health consequences of tobacco use is limited to two recent studies from the US (Moore 1996; Evans and Ringel, in press). Moore, using state-level data on tobacco-related death rates for the period from 1954 through 1988, concluded that higher cigarette taxes would significantly reduce smoking-related deaths. His estimates imply that a 10% increase in the cigarette tax would result in approximately 6000 fewer premature, smoking-related deaths in the United States each year. Similarly, Evans and Ringel (1999) used data on over 10.5 million births in the United States during the years from 1989 through 1992 to examine the impact of cigarette smoking and cigarette taxes on the incidence of low-birthweight births. They estimated a smoking prevalence elasticity of – 0.5 for pregnant women and, consistent with the medical literature,

found a strong positive relationship between cigarette smoking and the probability of a low-birthweight infant, leading them to conclude that increased cigarette taxes would significantly raise birthweight and reduce the adverse health and developmental consequences associated with low birthweight .

Similarly, several researchers in the United States have used estimates of the price-elasticities of smoking prevalence for different age groups to predict the likely impact of increased cigarette taxes, concluding that large tax increases would delay hundreds of thousands of premature, smoking-related deaths (Warner 1986; Harris 1987; US General Accounting Office 1989; Chaloupka 1998). Elsewhere in this volume, Ranson *et al.* employ a similar methodology to estimate the health benefits of global increases in the prices of cigarettes and other tobacco products (Chapter 18). Even under relatively conservative assumptions about the impact of price increases on demand and the impact of tobacco use on health, they conclude that millions of premature deaths could be avoided over the next several decades with even modest increases in tobacco taxes and prices.

10.5 Other issues in tobacco taxation

10.5.1 Tobacco tax earmarking

A significant feature of the tobacco tax structure in a growing number of countries is the hypothecation or earmarking of tobacco tax revenues for spending on specific activities. In part, these earmarked taxes reflect the growing use of increased tobacco taxes as a way to promote public health and/or more directly cover the social costs resulting from cigarette smoking and other tobacco use. For example, governments in several countries, including one of China's largest cities (Chongquing) and several US states (most notably California, Massachusetts, Arizona, and Oregon) earmark a portion of tobacco taxes for tobacco-related education, counter-advertising, and other tobacco-control activities. Still others dedicate a portion of their tobacco tax revenues to funding healthcare for under-insured populations, cancer control research, and other health-related activities, as well as, in others, general education (e.g. Canada, Ecuador, Finland, French Polynesia, Guam, Iceland, Indonesia, Korea, Malaysia, Nepal, Peru, Poland, Portugal, Romania, the United States, and others). Similarly, several Australian states, New Zealand, and others have adopted the 'Vic-Health model', using tobacco tax revenues to fund sporting and artistic events previously funded by the tobacco industry. An often debated, but yet to be adopted, form of earmarked tobacco taxes would dedicate a portion of the taxes to helping tobacco farmers and those employed in the manufacturing of tobacco products move into other crops and industries.

Many public finance economists have long opposed earmarked taxes because of the rigidities they introduce that make it more difficult to allocate general revenues among competing uses, while others have argued that the use of earmarked tobacco taxes to fund health promotion and disease prevention is consistent with the 'benefit principle' of taxation and can reduce the loss of producer and/or consumer surplus resulting from higher taxes (Hu *et al.* 1998). Moreover, given that many publicly provided health insurance programs target lower-income populations, this type of earmarking is

consistent with an overall system of taxes and transfers that promotes vertical equity. Similarly, to the extent that tobacco farmers and those employed in tobacco manufacturing bear part of the burden of increased tobacco taxes in the short run (although, as described in Chapter 13, the impact of higher taxes on tobacco-related employment has been overstated by the tobacco industry), earmarking part of the new revenues from tobacco tax increases for crop-substitution and retraining programs can significantly reduce the impact on tobacco growers and producers. As Hu and his colleagues described, many of the activities funded by earmarked tobacco taxes significantly reduce the welfare losses resulting from tobacco tax increases.

Moreover, tobacco tax increases that are earmarked for anti-tobacco media campaigns, prevention programs, subsidization of tobacco cessation products and programs, and other activities to reduce tobacco use, generate even larger reductions in tobacco use and improvements in health than the tax increase alone. As described by Saffer (Chapter 9), Kenkel and Chen (Chapter 8), and Novotny *et al.* (Chapter 12), the variety of anti-tobacco activities funded by earmarked tobacco taxes have led to reductions in cigarette smoking and other tobacco use that exceed those that would have been achieved in the absence of earmarking.

10.5.2 Tobacco tax increases and consumer price indices

Opponents of tobacco tax increases have argued that tax hikes would be inflationary, given that tobacco products are included in the basket of goods and services used in computing price indices in most countries, and given that many wages and salaries, and other public and private expenditures, are tied to these indices. While it is true that large tobacco tax increases would lead to increases in prices as measured by most consumer price indices, the impact of large tax increases on inflation would be very modest. Moreover, relatively modest tax increases would have almost no detectable effect on these indices.

One possible solution to the potential inflationary impact of tobacco tax increases is the construction of multiple price indices that are used for different purposes, as has been done in a number of countries. France, Luxembourg, and Belgium, for example, compute one consumer price index that excludes tobacco products and a second that includes these products. The latter is used for historical and international comparisons, while the former (excluding tobacco products) is used for the indexation of wages and social security allowances (Joossens, personal communication). Sweden did the same with petroleum products in the 1980s (Nordgren, personal communication).

10.5.3 Tobacco taxation and other market failures

As described more fully by Jha *et al.* (Chapter 7) and Kenkel and Chen (Chapter 8), there are other failures in the tobacco markets that justify government intervention in these markets, most notably the imperfect information in these markets. While many of the health consequences of cigarette smoking and other tobacco use are well known, others are continually being discovered. Similarly, while some populations are well aware of these risks (i.e. more educated persons), others are much less informed and/or myopically discount away the future health and other consequences of tobacco use to

their later regret. Moreover, even though the risks of tobacco use are generally understood in some countries (Viscusi 1992), tobacco users in these countries do not necessarily internalize these risks (Schoenbaum 1997). This suggests that the prevalence of tobacco use is much higher than it would be if users were well informed about the risks from tobacco use and appropriately internalized these risks.

Governments could use a variety of policies, including the increased taxation of tobacco products, to correct for these other market failures (see Chapter 7 for a discussion of alternative approaches). While clearly an appropriate tool for correcting for the net social costs of tobacco use, tobacco taxes are, in some respects, a less than ideal approach to correcting for these other market failures. Specifically, tobacco taxation is a blunt policy tool that reduces the welfare of tobacco users who choose to use these products with a clear understanding of the consequences of their addiction. However, in the absence of adequate knowledge, higher taxes can be justified (Cordes *et al.* 1990). This is particularly true when it comes to tobacco use among youth. A group of leading health economists who have studied the economics of tobacco use recently concluded that protecting children from a future of nicotine addiction, with its associated health risks, was the most compelling reason favoring increased tobacco taxation (Warner *et al.* 1995). They perceived higher taxes as an appropriate way to balance children's inadequate perceptions concerning the addictive nature of tobacco products and their relatively myopic behavior that discounts away the future health consequences of tobacco use, as well as an environment in which tobacco companies' multi-billion dollar advertising and promotion campaigns target youth. Given their relatively more elastic demands for tobacco products, the benefits from the large reductions in youth tobacco use resulting from a tax increase would be substantially larger than the losses incurred by adult tobacco users. Similar arguments could be made for other less-informed populations that are relatively more responsive to price, including less educated and lower income groups.

10.5.4 Barriers to tobacco taxation

There are a number of political, economic, and social arguments that have long been used as arguments against significant increases in cigarette and other tobacco taxes. Upon more careful analysis, however, these arguments are not persuasive and should not be used to discourage governments from raising tobacco taxes. Objections to higher taxes include the following: that higher tobacco taxes will lead to significant increases in smuggling between high-tax and low-tax countries; that tobacco tax increases necessarily place a disproportionate burden on the poor; that higher tobacco taxes will lead to reductions in tobacco tax revenues; and that tobacco tax hikes will lead to significant reductions in employment and macro-economic activity. This section briefly addresses these arguments; more detailed discussions are contained in other sections of this chapter and other chapters in this volume.

Tax increases and smuggling

It has been argued that higher tobacco taxes will lead to increased smuggling and related criminal activity, while not reducing tobacco consumption or increasing tobacco

tax revenues. While it is true that cigarette smuggling is a serious problem and that tax increases can lead to increases in smuggling, the scale of the problem has been significantly overstated (see Chapter 15 and Chapter 16). Numerous countries have significantly increased tobacco taxes without experiencing dramatic increases in smuggling. Likewise, sharp, industry-initiated price increases in some countries have not led to a significant rise in smuggling in these countries. Moreover, several relatively easy-to-implement policies, including improved tracking of cigarette consignments and stronger penalties for smugglers who are detected, could be used to address this problem.

Tobacco tax increases and the poor

A second common objection to tobacco tax increases is that they will fall disproportionately on the poor. While it is true that current tobacco taxes are regressive in most countries, given that tobacco use is more prevalent among those with lower incomes, a growing literature suggests that tobacco tax *increases* might be progressive. As described above, several recent studies conclude that lower income persons are more responsive to changes in cigarette prices than higher income persons, implying that increased cigarette taxes would reduce smoking by more in lower income groups than in higher income groups, reducing the relative burden of tobacco taxes on the poor. Moreover, tobacco taxes are but one part of an overall fiscal system that in most countries includes a wide variety of other taxes and transfer programs, suggesting that increased progressivity of other tax and transfer programs could be used to offset the regressivity of tobacco taxes. This is most clearly the case when the new revenues generated from tobacco tax increases are earmarked for programs that target low-income populations.

Tobacco tax increases and revenues

A third frequent misperception, often coupled with the first, is that increases in tobacco taxes will actually lead to reductions in tobacco tax revenues. Those making this argument suggest that the reductions in tobacco sales resulting from the tax increase would be so large as to more than offset the impact of the higher tax rate. Given the relatively inelastic demand for tobacco products and the current share of tobacco taxes in price, nearly every country has substantial room for increasing tobacco tax revenues by increasing tobacco taxes. Estimates described by Sunley *et al.* (Chapter 17) indicate that a relatively modest increase of 10% in cigarette taxes would lead to an increase of almost 7%, on average, in cigarette tax revenues. Moreover, even in countries where demand is relatively more elastic and taxes account for a relatively high share of tobacco prices, increases in these taxes will lead to increases in tax revenues.

Tobacco tax increases and the macro-economy

A final argument that is often employed in the debate over increased cigarette taxes is that these tax increases would lead to significant reductions in employment in

tobacco growing and manufacturing, as well as more general wholesaling, retailing, and other sectors. Consequently, opponents argue, the tax increases would have an adverse impact on the macro-economy. While it is true that employment in jobs directly related to tobacco growing and manufacturing would decline as a result of the reductions in tobacco consumption induced by the tax increase, the impact on other sectors is likely to be minimal. Moreover, as described more fully by Jacobs *et al.* (Chapter 13), employment in other areas would likely increase as the money smokers would have spent on tobacco products is spent on other goods and services, with the net macro-economic impact of higher tobacco taxes being negligible or positive in all but a very few countries.

10.6 Conclusions

Several clear conclusions emerge from the review of the economics literature on tobacco taxation contained in this chapter.

Increases in cigarette and other tobacco taxes will significantly reduce both the prevalence and consumption of tobacco products. Estimates from numerous studies indicate that the short-run price-elasticity of cigarette demand in high-income countries is in the range from – 0.25 to – 0.5 implying that a tax increase that raises prices by 10% will reduce cigarette smoking by up to 5%. Several studies indicate that increased taxes will be particularly effective in reducing tobacco use among youth and young adults, for whom demand is estimated to be up to three times more sensitive to price. The reductions are the result of reduced initiation of tobacco use, increased cessation, and reductions in the consumption of tobacco products by continuing users.

Emerging evidence from low-income and middle-income countries, as well as recent research on different socio-economic groups in high-income countries, implies that the effects of tobacco tax increases in developing countries would be larger than the impact of comparable increases in high-income countries. These recent studies suggest that the short-run price-responsiveness of cigarette demand in low- and middle-income countries is about double that in high-income countries. Thus, a tax increase that raises tobacco product prices by 10% in low-income and middle-income countries would lead to a reduction of approximately 8% in tobacco use in these countries.

Large tobacco tax increases, by significantly reducing the prevalence of tobacco use, would have a major impact on the health and other consequences of tobacco use. Even relatively modest increases in taxes would generate significant health benefits. Estimates indicate that global cigarette tax increases that raised prices by 10% everywhere would reduce premature deaths attributable to smoking by approximately 10 million in the current cohort of smokers (see Chapter 18). Almost 90% of these extended lives would be for persons in low- and middle-income countries.

Given the inelasticity of the demands for tobacco products in most countries, increases in tobacco taxes will result in sizable increases in tobacco tax revenues. Given existing tax levels, nearly every country has significant scope for generating new tax revenues through large tobacco tax increases. Estimates suggest that a 10% cigarette tax increase will lead to an average increase of nearly 7% in cigarette tax revenues in the short-run. Larger increases in revenues are expected in countries where demand

is relatively more inelastic, while smaller, but still sizable, increases are expected in counties where demand is more responsive to price.

Significant increases in tobacco taxes can be justified on several grounds, including as a relatively efficient tool for generating tax revenues, as a means to reduce inequity, as an appropriate way to promote economic efficiency, as an effective approach to improving public health, and as a way to correct for the market failures inherent in the markets for tobacco products. Given the relatively low levels of cigarette and other tobacco taxes in many low- and middle-income countries, as well as in several high-income countries, a policy that aimed these taxes to the point where they account for two-thirds to three-quarters of the retail prices of tobacco products appears achievable and appropriate.

Earmarking of revenues from higher tobacco taxes is consistent with many of the principles of appropriate tax policy and is likely to produce larger reductions in tobacco use and greater health benefits than would result from the higher taxes alone. The use of these revenues for mass-media campaigns on the health consequences of tobacco use, increased accessibility to nicotine-replacement products and other approaches to smoking cessation, particularly for low-income smokers, and the public provision of medical care are but a few examples of what many countries are doing and/or can do with earmarked tobacco taxes.

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THE Tax Burden ON TOBACCO

HISTORICAL COMPILATION VOLUME 48, 2013

Table 7
State Cigarette Tax Rates
(During Fiscal Years Ending June 30)

State	2010	2011	2012	2013
AL	42.5¢	42.5¢	42.5¢	42.5¢
AK	200	200	200	200
AZ	200	200	200	200
AR	115	115	115	115
CA	87	87	87	87
CO	84	84	84	84
CT	300	300	340	340
DE	160	160	160	160
DC**	250	250	286	286
FL	133.9	133.9	133.9	133.9
GA	37	37	37	37
HI	260	300	320	320
ID	57	57	57	57
IL	98	98	98	198
IN	99.5	99.5	99.5	99.5
IA	136	136	136	136
KS	79	79	79	79
KY	60	60	60	60
LA	36	36	36	36
ME	200	200	200	200
MD	200	200	200	200
MA	251	251	251	251
MI	200	200	200	200
MN*	156	157.6	160	160
MS	68	68	68	68
MO	17	17	17	17
MT	170	170	170	170
NE	64	64	64	64
NV	80	80	80	80
NH	178	178	168	168
NJ	270	270	270	270
NM	91	166	166	166
NY	275	435	435	435
NC	45	45	45	45
ND	44	44	44	44
OH	125	125	125	125
OK	103	103	103	103
OR	118	118	118	118
PA	160	160	160	160
RI	346	346	346	350
SC	7	57	57	57
SD	153	153	153	153
TN	62	62	62	62
TX	141	141	141	141
UT	69.5	170	170	170
VT	224	224	262	262
VA	30	30	30	30
WA	302.5	302.5	302.5	302.5
WV	55	55	55	55
WI	252	252	252	252
WY	60	60	60	60

*Starting in FY 2005, MN tax rate includes wholesale sales tax assessed in lieu of a general sales tax.
**Starting in October 2011, DC exempted cigarettes from the sales and use tax and replaced it with a surtax of 36¢ per 20 pack.

Table 13B — 2013
Cigarette Taxes as Percentage of Retail Price
Generic Brands Included In Average Calculation
(As of November 1, 2013)

State	Weighted Average Price Per Package	State and Federal Cigarette Taxes Per Package	Taxes as a Percentage of Average Retail Price
AL	494.2	143.5	29.0%
AK	865.9	301.0	34.8%
AZ	662.2	301.0	45.5%
AR	552.1	216.0	39.1%
CA	551.0	188.0	34.1%
CO	541.5	185.0	34.2%
CT	821.4	441.0	53.7%
DE	580.0	261.0	45.0%
DC	739.0	387.0	52.4%
FL	557.2	234.9	42.2%
GA	456.3	138.0	30.2%
HI	870.2	421.0	48.4%
ID	486.1	158.0	32.5%
IL	705.1	299.0	42.4%
IN	525.7	200.5	38.1%
IA	574.8	237.0	41.2%
KS	514.0	180.0	35.0%
KY	475.9	161.0	33.8%
LA	462.7	137.0	29.6%
ME	645.2	301.0	46.7%
MD	638.3	301.0	47.2%
MA	868.3	452.0	52.1%
MI	656.2	301.0	45.9%
MN	761.6	433.3	56.9%
MS	487.5	169.0	34.7%
MO	438.7	118.0	26.9%
MT	615.5	271.0	44.0%
NE	527.0	165.0	31.3%
NV	528.7	181.0	34.2%
NH	600.9	279.0	46.4%
NJ	737.0	371.0	50.3%
NM	616.8	267.0	43.3%
NY*	1003.0	536.0	53.4%
NC	462.7	146.0	31.6%
ND	455.2	145.0	31.9%
OH	563.1	226.0	40.1%
OK	553.3	204.0	36.9%
OR	568.3	219.0	38.5%
PA	594.4	261.0	43.9%
RI	821.9	451.0	54.9%
SC	487.9	158.0	32.4%
SD	576.6	254.0	44.1%
TN	496.5	163.0	32.8%
TX	574.7	242.0	42.1%
UT	629.6	271.0	43.0%
VT	767.2	363.0	47.3%
VA	493.9	131.0	26.5%
WA	774.5	403.5	52.1%
WV	483.0	156.0	32.3%
WI	742.1	353.0	47.6%
WY	501.8	161.0	32.1%
Weighted Avg. (by market share)	575.6	255.74	44.4%

*Price data includes responses from New York City and its $1.50/pack local tax.
Notes: Price estimates do not generally reflect the temporary price reductions that occur throughout the year. Price estimates do not include sales tax.

Availability of Tobacco to Youth Via the Internet

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RESEARCH LETTER

Availability of Tobacco to Youth Via the Internet

To the Editor: The number of Internet tobacco vendors continues to increase,[1-4] with 195 such Web sites identified in 2003.[2] Because teenagers and other minors frequently use the Internet[1] and online tobacco vendors rarely verify purchasers' age,[1-4] it is possible that minors can readily purchase tobacco products from the Internet.

Methods. We recruited 36 minors aged 15 to 16 years. All were interviewed by a licensed clinical psychologist who established that they understood the study, did not smoke, and did not appear at risk for smoking. Additional procedures for selecting and training them (eg, antitobacco workshops) have been detailed elsewhere.[5,6] Immunity from prosecution for youth and researchers was obtained from the State Attorney General, and the study was approved by the San Diego State University institutional review board.

The authors established an Internet account on a laptop computer and created e-mail addresses for youth. The laptop and a printer were taken to each child's home and connected to the home phone line. Youth were instructed to find an Internet tobacco vendor on their own; purchase 1 carton of cigarettes using their parents' credit card; lie about their age and birth date when asked; and have the carton delivered to their home. Based on the assumption that youth outside of studies would purchase tobacco online quickly to avoid being caught by parents, youth were instructed to do follow the above instructions as quickly as possible. We provided no additional assistance, but timed how long it took them to make a purchase. Youth printed every page from their purchases, revealing vendor name and age verification procedures. Prior to their purchase attempts, youth completed a survey on their Internet use and skills.

Results. Most used a single search word—"cigarettes"—usually spelled incorrectly. Nonetheless, 29 of the 30 (96.7%) found a tobacco vendor and placed an order. The mean (SD) time needed to do so was 25.8 (20.8) minutes, with many finding a site and placing an order in 7 minutes (mode, 7 minutes; median, 20 minutes). Fourteen sites were used; 13 (92.9%) required youth to click a box indicating that they were old enough to make the purchase, whereas 1 required entering a birth date. Twenty-three of the 30 youth (76.7%) received tobacco in the mail, with 91% of these cartons delivered without requests for proof of age. The average cost of a carton online was $22.91 (range, $10.50-$30.65). Delivery (vs no delivery) was unrelated to youth age (15 vs 16 years: $\chi^2=1.02$, $P=.31$), ethnicity (white vs minority: $\chi^2=0.95$, $P=.95$), sex ($\chi^2=0.68$, $P=.41$), time to complete the purchase ($t=0.855$, $P=.40$), or frequency of using the Internet ($\chi^2=1.15$, $P=.28$) and skill in its use (rated from "first-time user" to "expert") ($\chi^2=1.17$, $P=.56$).

Comment. To our knowledge, this is the first study in which underage youth (rather than adult researchers[3] or adult college students[4]) attempted to locate Internet vendors of tobacco products and to order tobacco on their own, without adult assistance. That 96.7% did so suggests that youth indeed can easily purchase tobacco online. Youths' online access (76.7% delivery) significantly exceeded their access to tobacco from other commercial sources statewide (12%-17%),[5,6] and far exceeds the federal goal of 20% commercial access.[5,6] In addition, a carton of cigarettes online was significantly cheaper ($23) than in a California store ($43). Such results strongly suggest that it is easier and cheaper for youth to purchase tobacco online than from other commercial sources.

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did not reach statistical significance. The mean delay to vaccine administration was 30.1 days (range, 0-114 days). The reasons for nonvaccination were no return to their primary physician's office (24 [77.4%]), their primary physician running out of vaccine (5 [16.1%]), or refusal to vaccinate (2 [6.5%]).

Comment. A substantial percentage of children in this study (22%) never received their influenza vaccine because of lack of insurance authorization. This may actually be an underestimation of the problem because there may have been increased demand for vaccination compared with previous seasons because of increased media reports of pediatric deaths from influenza that season.[3] There was a trend toward less vaccination in children with Medicaid HMOs, which could be a factor in the poorer asthma outcome seen in children with asthma with Medicaid.[4]

Children with chronic medical disorders are at high risk for influenza-associated morbidity[2] yet paradoxically have lower vaccination rates.[5] Subspecialty clinic visits represent opportunities for vaccination of these patients, and an AAP policy statement[1] recommends that influenza immunization be started as early in the season as possible and at all visits—not just well-child visits. In addition, requiring extra physician visits solely for immunization increases costs to families and the health care system and makes influenza vaccination less cost-effective.[6]

Changes in authorization procedures and policies should be implemented to allow vaccinations by subspecialty physician offices in the same manner as primary care physician offices.

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Internet Cigarette Vendors' Lack of Compliance With a California State Law Designed to Prevent Tobacco Sales to Minors

Efforts by public health and law enforcement officials in recent years have had a substantial impact on reducing youth access to cigarettes through retail stores, leading to growing concern over youth access to cigarettes from Internet cigarette vendors (ICVs). This has led some states to pass legislation governing Internet tobacco sales to minors. California Business and Professions Code § 22963[1] (BP § 22963) is currently one of the most stringent ICV youth access laws because it requires vendors to comply with 6 provisions designed to reduce youth purchases of cigarettes via the Internet. This study, unlike others that have assessed compliance with existing state laws regulating retail store cigarette sales, assessed vendor compliance with a new state law specifically regulating Internet cigarette sales.

Methods. An adult research assistant purchased cigarettes from 101 ICVs randomly selected from a January 2003 sample identified as part of an ongoing longitudinal study examining the sales practices of ICVs.[2] Data were collected at each step of the ordering/package receipt process to determine the level of vendor compliance with the 6 provisions of BP § 22963: (1) verifying the buyer's age either by using a government database to verify name, address, and date of birth or by collecting a copy of a government-issued photo identification and a signed age attestation statement; (2) delivering packages only to the address used for age verification, which must match the buyer's credit card billing address; (3) requiring a 2-carton or more minimum order; (4) refusing to accept money orders; (5) including the words "tobacco product" on credit card statements; and (6) calling buyers after 5 PM to confirm orders prior to shipping.

Table. Internet Vendor Compliance With Provisions of California Business and Professions (BP) Code § 22963,[1] a Law to Prevent Internet Cigarette Sales to Minors

	No.	% (95% Confidence Interval)
Provision		
Did not accept money orders	50	49.5 (40.0-59.1)
Required ≥2-carton minimum purchase	25	24.8 (17.4-34.0)
Age verified as specified in BP § 22963	0	0.0 (0.0-3.7)
Called buyer after 5 PM to confirm order	0	0.0 (0.0-3.7)
Delivered packages only to verified billing address	0	0.0 (0.0-3.7)
"Tobacco product" included on credit card statement	0	0.0 (0.0-3.7)
Level of compliance		
Complied with at least 1 provision	63	62.4 (52.6-71.2)
Complied with 2 provisions	11	10.9 (6.2-18.5)
Complied with all provisions	0	0.0 (0.0-3.7)

Results. All of the 101 purchases made in this study were successfully received. None of the vendors fully complied with all 6 provisions of the law. Some vendors complied with 2 of the provisions: nearly half (49.5%) of the vendors did not accept money orders, and about one quarter (24.8%) required a 2-carton or more minimum purchase (**Table**). No vendors complied with the other 4 provisions.

Comment. Our results indicating zero compliance with BP § 22963 are discouraging. Comparatively, recent Food and Drug Administration compliance checks in retail stores yielded an overall 26.6% rate of cigarette sales to minors.[3] The low rate of compliance in our study indicates that either ICVs were unaware of the law or they did not believe compliance was important. The California Attorney General's office sent letters to more than 200 ICVs seeking compliance with BP § 22963 in September 2002 and February 2003, making the former possibility unlikely (Laura Kaplan, California Deputy Attorney General, written communication, November 2005).

The high rate of noncompliance may be due to the fact that the state of California had not yet actively enforced this law prior to our purchase study. As a result, vendors had little motivation to comply. In the retail environment, merchant education efforts combined with enforcement have had substantial success in increasing vendor compliance with youth access laws.[4]

After this study was conducted, the state of California filed lawsuits against several vendors for not complying with BP § 22963.[5] Whether these enforcement efforts will lead to increased compliance with BP § 22963 should be examined. A follow-up compliance survey needs to be done to assess whether California's enforcement efforts have improved vendor compliance and to determine whether more aggressive enforcement and the imposition of high fines on offenders achieves the goal of effectively reducing youth access to cigarettes via the Internet.

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