

Chapter 10

Summary

Overview of tobacco taxation

Worldwide, different types of taxes apply to tobacco products, with different tax levels (rates) contributing to significant price differentials. Historically, revenue generation has been the primary aim of tobacco taxation. However, the retention and the increase of excise taxes on tobacco products increasingly aim to improve public health by reducing tobacco consumption and accounting for the external cost of smoking. Nonetheless, when determining their taxation policy, governments will take into account other, at times competing, political, social or economic considerations. These considerations are often reflected in the applicable tax structure and rates.

Moreover, tax levels are generally directly related to income levels by country, with high-income countries having high taxes and vice versa. Simultaneously high-income countries tend to favour specific (per-unit) excise tax structures, while low- and middle-income countries rely more on *ad valorem* (value-based) excise taxes. Some countries have designed more complex taxation structures in an attempt to find a balance between budgetary, health and competition objectives.

Specific excise taxes generally result in higher tobacco product prices. Specific excises can increase tobacco companies' pricing power, raise profits and increase market concentration.

About 75% of the world's tobacco product market is accounted for by cigarettes. However, in some countries tobacco products other than cigarettes have an important, sometimes significant, market share. Tax levels are often much lower on these products as compared to cigarettes. Differential rates are sometimes applied within the same product category. These differences result in price gaps and opportunities for product substitution to lower-taxed products and brands. Applying a similar tax level would reduce the incentive for substitution and increase the effectiveness of taxation policy in reducing tobacco use.

Given their important revenue-generating potential, part or all of tobacco tax revenues have been used to fund health or tobacco control activities in some countries. This practice can be adopted in low-resource countries as a way to strengthen weak health systems, as proposed by the Taskforce on Innovative International Financing for Health Systems.

Industry pricing strategies and other pricing policies

This chapter examines industry pricing strategies, pricing and price-related marketing strategies, as well as industry efforts to influence all dimensions of tobacco tax policy, including tax structure, tax levels, and earmarking of tobacco tax revenues.

The impact of tobacco taxes on prices will vary according to how the industry reacts to the tax increase. Early empirical evidence was mixed in the extent to which taxes were passed through in prices. More recent studies in the USA, South Africa and Jamaica found that tax increases led to price increases larger than the tax increase (overshifting).

Tobacco companies employ a variety of marketing techniques that reduce prices on some tobacco products or brands. These efforts are targeted at some specific populations, including young people, and have been used to soften the impact of tobacco tax increases and other tobacco control interventions.

Tobacco companies have lobbied aggressively to influence tobacco tax levels and the earmarking of tobacco tax revenues. Evidence, almost entirely from North America, shows that industry lobbying has been successful, particularly at the federal level. At the subnational level,

adequately funded tobacco control efforts have been more successful in overcoming industry opposition. The industry has been more successful at the subnational level combating the earmarking of tax revenues, arguing that the revenues will be diverted or misused.

The industry has also attempted to influence tobacco excise tax structures. Studies from the USA, the former Soviet Union, Hungary, China and Lebanon show that different companies support different tax structures, favouring those that will benefit their brands at the expense of their competitors.

Governments can influence tobacco product prices through tobacco taxes, price regulations, and limits on price-related marketing. Some have implemented minimum pricing policies where such policies are allowed under competition law; higher specific taxes can have similar effects where minimum pricing policies are not allowed. Others have included bans on price-reducing marketing as part of a comprehensive ban on industry marketing. WHO FCTC Article 5.3, which aims to limit tobacco industry influence in tobacco control policy-making, may provide a tool for governments to constrain tobacco company lobbying efforts focusing on tax policy or other tobacco control policies.

Conclusions

- Most tobacco product markets are highly concentrated. In these markets, recent empirical evidence indicates that tobacco taxes are generally overshifted.

- Tobacco companies use price-reducing marketing techniques to counteract the impact of tobacco excise tax increases and other tobacco control policies.

- Tobacco companies lobby against tobacco tax increases and earmarking of tobacco tax revenues.

- Tobacco companies try to influence the structure of tobacco taxes to work in their interests and against those of their competitors.

Tax, price and aggregated demand for tobacco

A large and growing body of empirical literature, dominated by studies from the USA and to a lesser extent the United Kingdom, has found that tobacco consumption decreases when the price of tobacco increases. The highly-influential World Bank publication *Curbing the Epidemic* states that the price elasticity of demand (the percentage change in consumption of a product that results from a 1% price increase) is around -0.4 for developed countries and between -0.4 and -0.8 for developing countries.

The evidence that has emerged since the World Bank's publication suggests that, at least based on aggregate demand studies, the consensus price elasticity of around -0.4 is still valid for high-income countries, although the price elasticity estimates for high-income countries other than the USA and United Kingdom are somewhat more dispersed. The majority of price elasticity estimates from aggregate demand studies for low- and middle-income countries lie between -0.2 and -0.8 . However, many lie outside this range (especially on the inelastic side).

Income is a significant determinant of tobacco product demand; as aggregate income increases, the aggregate demand for tobacco increases. Most estimated income elasticities (the percentage change in consumption of a product that results from a 1% income increase)

are positive, with greater elasticity observed in low- and middle-income countries. With the exception of the United States, where income elasticity has declined, there is no evidence that income elasticity has changed in other countries. This implies that for a growing economy, the price of cigarettes would have to increase at the same rate as income to maintain the affordability of cigarettes.

There is significant variation in the theoretical models employed and the econometric methods used to estimate them. Given the development in economic models of addiction, estimated specifications should account for addiction where the data allow. While it has become the norm to control for addiction in the model specifications, the use of state-of-the-art time series techniques has not become prevalent. However, despite the variety of techniques that have been used, estimates from studies using different techniques are similar.

Conclusions

- Studies that are based on aggregate data are useful in estimating price and income elasticities of overall demand for tobacco products.

- There is a negative relationship between cigarette prices and cigarette consumption in countries at all levels of income. While fewer studies have examined the demand for other tobacco products, those that have done so have reported a similar negative relationship.

- Price elasticities of cigarette demand in high-income countries average -0.4 . Most estimates from the USA and the United Kingdom fall in a relatively narrow range between -0.2 and -0.6 , while there is greater variation in high-income countries

other than the USA and the United Kingdom.

- There is greater variation in price elasticity estimates in studies from low- and middle-income countries, likely due to differences in affordability and availability of different tobacco products across and within countries. Most estimates indicate that demand in low- and middle-income countries is less price-inelastic than in high-income countries, as most estimates lie between -0.2 and -0.8 .

- Most income elasticities are positive and lie between 0 and 1 in both high-income and low-and-middle-income countries. There is evidence of declining income elasticities over time in the USA.

- Affordability has become an increasingly recognized measure, especially in rapidly growing low- and middle-income countries where the impact of price increases might be offset by growth in income.

Tax, price and adult tobacco use

A large and growing number of studies have used individual-level or household-level survey data to assess the impact of tobacco product taxes and prices on adult tobacco use. Studies have used survey data to examine the differential impact of tax and price on tobacco use among population subgroups defined by gender, age, socioeconomic status and/or other characteristics, as well as to assess the separate effects of price on different aspects of tobacco use, including prevalence, frequency, intensity, initiation, uptake and cessation. This chapter reviews studies that examine the effects of price on adult tobacco use, with subsequent chapters (Chapters 6 and 7) reviewing studies on tobacco use among young people and different socioeconomic groups.

Empirical methods for estimating tobacco demand using individual or household data have become more sophisticated over time, and greater computing power has allowed the application of these methods to increasingly large survey data sets, including repeated cross-sectional and longitudinal survey data sets.

Most studies based on survey data come from the United States, because of its extensive subnational and temporal variation in taxes and prices. These studies find that adult smoking prevalence, frequency and intensity are negatively related to cigarette taxes and prices. As with the elasticity estimates obtained from aggregate data for the USA, most of the total elasticity estimates from the studies based on US survey data fall within the range from -0.2 to -0.6 , with roughly half of the impact of price on adult prevalence and the remainder on the number of cigarettes consumed by adult smokers. Several studies have examined adult smoking cessation, generally finding that higher taxes and prices reduce the duration of smoking, raise interest in quitting, boost quit attempts, and increase the number of smokers who successfully quit smoking. Finally, a few US studies found similar effects of tax and price on the use of other tobacco products such as smokeless tobacco and cigars, and produced some evidence of substitution among tobacco products in response to changes in the relative prices of these products.

While several studies employing survey data on adult tobacco use have been conducted in other high-income countries, relatively few of these have estimated the effects of tax and price on adult tobacco use in these countries, largely due to the limited price variation within most countries. Studies on the price elasticity of adult smoking have been

done in Canada; Taiwan, China; Italy; the Republic of Korea; Spain; and the United Kingdom. These studies generally find that cigarette smoking prevalence and intensity are inversely associated with cigarette prices, with the size of the association varying across countries. Estimates from these studies are generally in the range produced by the aggregate demand studies from high-income countries other than the USA, as discussed in Chapter 4. Studies that consider gender differences produce contrasting conclusions about the relative price elasticities of men and women, depending on the country for which the study was done. A few studies from high-income countries have concluded that higher prices increase cessation.

There exists a larger number of survey-based studies of adult tobacco demand in low- and middle-income countries—including Bulgaria, China, Estonia, Egypt, India, Indonesia, Mexico, Myanmar, Nepal, the Russian Federation, South Africa, Sri Lanka, Thailand, Turkey, and Viet Nam—with many of these studies based on household expenditure survey data. The sophistication of the methodological approach used in these studies varies considerably. Several studies use self-reported prices, which almost certainly produce biased estimates that suggest greater price elasticity. Some studies use composite tobacco price measures rather than product-specific measures of price. The range of price elasticities for adult tobacco use produced by these studies varies considerably. Despite these limitations, these studies generally confirm that various aspects of adult tobacco use are responsive to price, with higher prices reducing adult prevalence and intensity of use.

No clear patterns emerge from the small number of studies from

countries other than the USA that consider substitution among tobacco products in response to changes in the relative prices of these products. The same is true for studies that examine differences in price elasticity by gender.

Conclusions

A relatively large body of literature on adult tobacco demand based on US survey data shows that:

- Adult smoking prevalence is inversely related to price, with prevalence falling as prices rise and vice versa;
- Intensity of smoking among adults is inversely related to price, with cigarette consumption among smokers falling as prices rise and vice versa;
- The price elasticity of adult smoking is in the range from -0.2 to -0.6 , with about half of the effect of price on smoking prevalence and the remainder on intensity of smoking among adult smokers; and
- Cigarette prices affect cessation-related outcomes, with higher prices increasing interest in quitting, quit attempts, and successful cessation.

A few studies from the USA indicate that:

- Higher cigarette prices increase the likelihood that smokers will smoke only on some days rather than every day;
- Changes in other tobacco product taxes and prices inversely affect the use of these products; and
- There is substitution between cigarettes and smokeless tobacco products in response to changes in the relative prices of these products.

A small number of studies from other high-income countries show that adult smoking in these countries responds to changes in price, with

estimates of price elasticity consistent with those found in aggregate demand studies for these countries, with total elasticity estimates in the range from -0.2 to -0.6 .

Studies from a growing number of low- and middle-income countries indicate that adult tobacco use in these countries is inversely related to tobacco product prices. Methodological differences and other factors contribute to the considerable variation in the price elasticity estimates produced by these studies.

Tax, price and tobacco use among young people

Economic theory predicts that tobacco use among young people would be more responsive to price than would adult tobacco use. To a great extent, the empirical evidence supports this. Many econometric studies from countries at all income levels find that smoking prevalence and intensity among young people decreases as cigarette price increases. The estimated overall price elasticity of demand for young people in most high-income country studies ranges between -0.50 and -1.2 ; however, the dispersion of price elasticity estimates for young people in low- and middle-income countries is greater. While the studies examining the impact of price and tax on other tobacco products are fewer in number than those for cigarettes, a similar relationship exists for other tobacco products.

Studies of smoking initiation that use cross-sectional data produce mixed results primarily because of the measurement error inherent in using retrospective measures of initiation. Most studies that use longitudinal data find that higher prices of cigarettes significantly decrease youth smoking initiation and vice versa. Studies from the USA, using

cross-sectional or longitudinal data, consistently find that higher prices lead to smoking cessation among young people. Similar studies find that higher prices deter progression into later stages of smoking uptake.

Conclusions

- As tobacco price and tax increases, smoking prevalence among young people falls, and vice versa.
- As tobacco price and tax increases, smoking intensity among young people falls, and vice versa.
- Most longitudinal studies from high-income countries find that smoking initiation is inversely related to price.
- Estimates from studies on tobacco use among young people indicate that their tobacco use is more responsive to price than is tobacco use among adults.
- The same conclusions generally apply in low- and middle-income countries but are based on fewer studies.
- A few studies, nearly all from the USA, find:
 - Cigarette prices influence different stages of uptake of cigarette use, with a relatively larger impact at later stages of uptake.
 - Price has both a direct effect and an indirect effect, through peer and family influences, on tobacco use among young people.
 - As cigarette prices increase, smoking cessation among young people increases.

Tax, price and tobacco use among the poor

In most countries, tobacco use is inversely related to indicators of socioeconomic status, with the possible exception of some upper middle-income countries. Spending

on tobacco diverts spending from other goods and services, and this tends to be greater for lower-income households. There is a two-way relationship between tobacco use and poverty.

Current excise taxes on tobacco are generally regressive in high-income countries; that is, the amount of tax as a percentage of income increases as income decreases. Few studies have examined the regressivity of tobacco taxes in low- and middle-income countries, finding mixed evidence of regressivity of tobacco taxes, in part because of the structure of these taxes.

The price responsiveness of tobacco demand is generally found to be higher among the poor than among the rich in high-income countries, based largely on evidence from the USA and the United Kingdom. Given this evidence, increases in tobacco taxes can reduce the regressivity of these taxes.

Evidence from other countries does not suggest an obvious relationship between price responsiveness and socioeconomic status. This may be due to differences in the extent of opportunities for tax avoidance and evasion across countries, tax structures and the resulting price gaps, and other factors. Given this mixed evidence, the equity implications of tobacco tax increases in low- and middle-income countries is unclear.

Conclusions

The price responsiveness of tobacco demand is generally higher among the poor than the rich in high-income countries, based largely on evidence from the USA and the United Kingdom.

Evidence from other countries on the relationship between price responsiveness and socioeconomic status is mixed.

Tax avoidance and tax evasion

Tax avoidance refers to legal methods of circumventing tobacco taxes, and tax evasion refers to illegal methods of circumventing tobacco taxes. Illicit trade includes both legally produced products illegally traded across borders (smuggling) and illegally manufactured products. Most activities that comprise tax avoidance include the payment of some tobacco taxes. In most cases, tax avoidance is practiced by individuals. Tax evasion includes both small and large quantities of tobacco products, and usually no taxes are paid. These activities may involve criminal networks, tobacco companies, or other large-scale operations.

Several studies show that tax and price differentials play an important role in individual tax avoidance and small-scale smuggling operations. Other important factors include the extent of tourist travel, access to duty-free and other tax-free outlets, and technology allowing virtual transactions such as internet sales.

The determinants for large-scale illicit trade are far more complex. The greater the reward and the lower the costs of supplying these illicit products, the greater the probability that this activity will occur. Research shows that these determinants include corruption, informal distribution networks, the presence of organized crime, the extent of cross-border trade and strength of border controls, insufficient penalties, weak tax administration and enforcement, differential treatment of domestically-produced and imported products, the pre-tax price of tobacco products, and the strategies of tobacco companies, as well as price and tax levels.

Comprehensively measuring tax avoidance and tax evasion presents

challenges that researchers have attempted to overcome via innovative methodologies. No single method addresses all of these difficulties, and each method is inherently limited. A combination of methods is needed to fully assess the extent of these measurement challenges.

Studies show that tax avoidance and tax evasion reduce but do not eliminate the effectiveness of tobacco tax increases in reducing tobacco use and raising revenues. Tobacco tax avoidance and evasion undermine other tobacco control measures. Tax evasion adds to health disparities between socioeconomic groups.

Research on the effectiveness of strategies aimed at reducing tax avoidance and evasion is limited and difficult. Tax evasion can be reduced via a combination of various strategies such as international cooperation, legislative measures to control the supply chain, increased enforcement and strong penalties, as shown by evidence largely from case studies. The modus operandi for the supply of illegal tobacco products may change over time as illicit traders adapt their practises in response to government actions.

To reduce cross-border shopping, small-scale smuggling, and some types of tax avoidance, effective strategies include coordination of tobacco tax levels and increases across jurisdictions, and elimination of duty-free shopping.

Conclusions

- The primary determinant of tax avoidance and small-scale smuggling is differentials in taxes and prices across jurisdictions.

- There are multiple determinants of tax evasion. These include the level of corruption, informal distribution networks,

the presence of organized crime, the extent of cross-border trade and strength of border controls, insufficient penalties, weak tax administration and enforcement, differential treatment of domestically-produced and imported products, the pre-tax price of tobacco products, and the strategies of tobacco companies, as well as price and tax levels.

- The majority of existing studies capture both tax evasion and tax avoidance to some extent. The limited empirical evidence indicates that tax evasion is much larger in scale than tax avoidance.

- Cigarette tax evasion is higher in countries that have lower cigarette prices and taxes.

- Data indicate that the size of this illicit market is inversely related to a country's income.

- The threat of smuggling discourages governments from raising tobacco taxes or motivates tobacco tax reductions.

- Studies demonstrate that an increase in cigarette taxes will reduce cigarette consumption and increase cigarette tax revenues even in the presence of illicit cigarette trade.

- Eliminating the supply of illicit tobacco would result in larger than average reductions in smoking among young people and the poor.

- Illicit trade in tobacco products undermines the impact of other tobacco control policies such as youth access laws and health warnings.

- To reduce tobacco tax evasion, a multifaceted and flexible approach is most effective.

- To reduce cross-border shopping, small-scale smuggling, and some types of tax avoidance, effective strategies include coordination of tobacco tax levels and increases across jurisdictions, and elimination of duty-free shopping.

Economics and health impact of tobacco taxation

Tobacco taxes can be expected to have a large impact on society through several different channels. A large body of literature examines the effect of smoking on health care expenditures and health outcomes. These studies find that reducing smoking through increased taxes increases the life expectancy of smokers by reducing cancers (especially lung cancer), respiratory diseases and cerebral and cardiovascular diseases. The reduction in smoking that results from higher taxes also reduces the medical costs attributable to smoking. Further health gains can be expected through reductions in secondhand smoke exposure and reduced maternal smoking. In addition, reductions in tobacco use through price increases have been associated with reduced alcohol and illicit drug use, although the evidence is mixed. The effects on obesity of reduced smoking resulting from higher taxes are less clear. Given the low costs of administration, tax increases are a highly cost-effective intervention for improving health.

Tobacco tax increases generally increase tax revenues. Some governments have earmarked tax revenues for tobacco control programmes and/or other health promotion efforts. Tax-funded tobacco control programmes further reduce tobacco use and its health and economic consequences.

Most economic studies on the employment impact of reduced tobacco consumption have found that reductions in tobacco-dependent employment are more than offset by increases in employment elsewhere. Finally, increased tobacco taxes have been shown to have minimal if any effect on general price inflation.

Conclusions

- Increasing tobacco excise taxes is a cost-effective way to improve population health and reduce medical costs.

- Empirical evidence from around the world shows that increasing tobacco taxes will generally increase government revenue.

- Most studies on the employment impact of reductions in tobacco use find that reductions in tobacco-dependent employment are more than offset by increases in employment elsewhere.

- Earmarking of tobacco taxes for tobacco control programmes has been shown to be an effective policy instrument to achieve tobacco control.

- Increased tobacco taxes have been shown to have minimal, if any, effect on general price inflation.