Section V
Policy directions

17

The design, administration, and potential revenue of tobacco excises

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This chapter discusses the design and administration of tobacco excise taxes. With respect to design, the issues reviewed here include the choice of tobacco products to excise, the treatment of imports, and the choice of specific taxes (based on quantity) versus *ad valorem* taxes (based on value). We also briefly discuss the impact of smuggling on tax revenues. With respect to tax administration, the issues discussed here include the use of registration and licensing to facilitate administration, bonding, physical control of tobacco products, and the use of tax stamps. Finally, the revenue-generating potential of higher cigarette taxes is examined. Using data on tax revenues, tax rates, and prices, we calculate that an increase in cigarette taxes of 10% globally would raise cigarette tax revenues by nearly 7%, with relatively larger increases in revenues in high-income countries and smaller, but sizable, increases in revenues in low-income and middle-income countries.

17.1 Introduction

The aim of this chapter is to provide brief information on the design and administration of tobacco excise taxes and to examine the likely outcome, for revenue generation, of an increase in cigarette taxes applied globally. The impact of tobacco taxes on tobacco consumption is not discussed in this chapter (see Chapter 10 for a detailed discussion of this issue).

17.2 The design of tobacco excises[1]

17.2.1 Which tobacco products to excise?

Most governments impose tobacco excises primarily to raise revenue, although some have recently increased their taxes to discourage tobacco consumption and promote public health. Tobacco excises, and excises on alcoholic beverages and petroleum products, are a significant revenue source in most countries. Among the OECD countries in 1994, for example, excises raised amounts varying from 3% of total revenues (in the United States) to 23% (in Greece), with the majority of countries raising sums in the range between 6% and 11% of total revenues. Some low-income and middle-income countries raise more than 20% of their total revenues by excises, particularly those

[1] For further discussion and sources, see Terra (1996), McCarten and Stotsky (1995), and Ferron (1984).

countries that have not adopted a broad-based value-added tax (VAT) through the retail stage. The share of all excise taxes attributable to tobacco excise is substantial in most countries. A clear advantage of tobacco excises is that they are easier to administer than broad-based consumption taxes or direct taxes on income.

Cigarettes are the primary tobacco product and generally account for more than 90% of the revenue from tobacco excises. It is customary, however, for countries to tax all types of tobacco—cigarettes, cigars, pipe tobacco, snuff, or chewing tobacco—although the tax rates on tobacco products other than cigarettes are typically lower. All tobacco products compete with each other and all have health effects that warrant a tax. Many countries excise hand-rolling tobacco to eliminate any tax incentive to 'roll your own'. A system that imposes differential taxes and, consequently, results in significant differences in prices, can lead consumers to substitute away from relatively highly priced products towards those with lower prices. For example, when Egypt increased its tax on manufactured cigarettes but not on *shisha* tobacco (a type of pipe tobacco), *shisha* smoking increased while cigarette smoking declined (Townsend 1998).

17.2.2 Treatment of imports

The best international practice is to impose excises on the destination basis, under which imports are taxed and exports are freed of tax. Moreover, excises should apply equally to goods that are imported or domestically produced. This ensures that the excises apply uniformly to all domestic consumption of the excisable goods. Under the General Agreement on Tariffs and Trade, countries may impose compensatory taxes on imports and may exempt, or remit, taxes on exports, but they are not required to do so. Discrimination is also forbidden: imported products shall 'not be subject, directly or indirectly, to internal taxes or internal charges of any kind in excess of those applied directly or indirectly to like domestic products' (Terra 1996). In general, the principle of non-discrimination requires that a country levy an identical excise on domestic products and the same or similar products imported from other member countries.

Most countries follow the practice of excising imports and not taxing exports, although a few countries (Pakistan, for example) follow the old Commonwealth tradition that excises are levied on domestic production alone. Though in theory import duties can be coordinated with excises that apply only to domestic products, there can be difficulties in doing so, particularly when import prices are subject to change.

Most countries impose both a customs duty and an excise tax on excisable imports specifying the excise base for *ad valorem* excises as the price plus the customs duty. Although following this procedure appears to result in a tax on a tax, it ensures that a customs duty of, say, 10% will raise the cost of an imported good by 10% even when the imported good is subject to the excise tax. Consider this illustration. If the customs value is 100, a customs duty of 10% increases the cost to 110. If the customs duty is included in the base of the excise tax, a 20% excise tax will increase the cost further to 132. This cost is 10% higher than if the import were subject only to the excise tax (i.e. 132 is 10% higher than 120). Similarly, most countries that impose value-added taxes impose them on a base that includes any excise tax and customs duty. A VAT of 10% will raise the cost of the good by 10%, even when the good is subject to an excise tax (or a customs duty).

17.2.3 Specific taxes versus *ad valorem* tax rates

Excises can be either specific taxes (based on quantity) or *ad valorem* (based on value). Many countries impose specific rates on certain excisable goods and *ad valorem* rates on other excisable goods, particularly for goods varying widely in quality, such as jewellery or fur coats, that would be difficult to assess under specific rates. The United States, for example, excises cigarettes and small cigars using specific rates but excises large cigars using *ad valorem* rates. Some countries impose specific minimum rates with *ad valorem* supplements on some excisable goods.

In the European Union (EU), the excise duty of each member country on cigarettes must consist of two parts: one *ad valorem* and one specific. The specific element must represent between 5% and 55% of the total tax burden (excise duty plus VAT) of the most popular price category (MPPC) sold in that country (usually, king-size filter brands). The combination of specific and *ad valorem* rates reflects a political compromise that 'blessed' the then-current tax regime for cigarettes in most EU countries. The minimum rates for other manufactured tobacco—cigars and cigarillos, hand-rolling tobacco, and other smoking tobacco—are expressed in *ad valorem* terms. Some countries, (Armenia, for example) impose a specific excise that serves as a floor under the general *ad valorem* tax. The taxpayer pays either the *ad valorem* tax or the specific excise, whichever is greater.

In general, tobacco taxes in low-income and middle-income countries are well below taxes in high-income countries; consequently, cigarette prices in low-income and middle-income countries are well below prices in high-income countries. Cigarette taxes, for example, account for two-thirds or more of the pack price in most high-income countries (with the notable exception of the United States), compared to half or less of the pack price in low-income and middle-income countries (see Table 17.1).

Ad valorem taxation has a multiplier effect as part of any increase in the consumer price goes to the government as tax revenue (Keen 1998). In contrast, specific excises protect the revenues from price wars or reductions. With an *ad valorem* tax, the government, in effect, 'subsidizes' the price reduction. Specific excises can facilitate revenue forecasts inasmuch as external influences may significantly change the buying patterns in regard to 'high-' or 'low-quality' products, even though the overall demand is relatively inelastic. The multiplier effect creates a disincentive to the manufacturer to improve a product's quality, while specific taxation encourages upgrading when variants of the product differ in quality. For example, specific excises may lead to greater consumption of the high-quality brands. Thus, when quality and variety are considered important in a type of product, economic theory points to specific taxation.

If a primary purpose of the excise is to discourage consumption of cigarettes, a strong case can be made for specific excises that would impose the same tax per cigarette. There are exceptions, however, since the tobacco industry is likely to seek ways to minimize the impact of these taxes on consumption. Townsend (1998), for example, describes how in the United Kingdom, the switch from a system where taxes were based on the weight of tobacco to a system in which they were imposed per cigarette led tobacco companies to market 'king-sized' and 'super king-sized' cigarettes, actually lowering the total tax per amount of tobacco smoked. Similarly, Evans and Farrelly (1998) found that increases in cigarette excise taxes, while significantly reducing smoking prevalence, led some continuing smokers to switch to longer cigarettes or

Table 17.1 Cigarette prices and taxes, selected countries, by income group

	Tax (US$)	Tax as % of price
High-income		
Australia	3.15	65
Austria	2.16	73
Belgium	2.49	75
Canada	2.04	51
Denmark	4.38	84
Finland	3.28	73
France	2.17	75
Germany	2.43	72
Ireland	1.27	75
Italy	1.60	73
Japan	1.46	60
Korea, Republic of	0.46	60
Netherlands	2.15	72
New Zealand	3.19	68
Norway	5.47	78
Portugal	1.19	81
Spain	0.99	72
Sweden	3.16	69
Switzerland	1.45	52
United Kingdom	3.24	78
United States	0.58	30
Upper middle-income		
Argentina	0.97	70
Brazil	0.79	75
Chile	0.62	70
Czech Republic	0.0003	0.1
Greece	1.39	73
Hungary	0.22	42
Malaysia	0.23	33
Mexico	0.38	60
Poland	0.20	39
Slovak Republic	0.20	34
Slovenia	0.68	63
South Africa	0.44	33
Lower middle-income		
Bolivia	0.20	61
Bulgaria	0.25	42
Colombia	0.03	45
El Salvador	0.28	42
Indonesia	0.0001	30
Jamaica	0.16	42
Philippines	0.14	63
Thailand	0.37	62
Turkey	0.22	42
Venezuela	0.04	50
Low-income		
Albania	0.20	70
Armenia	0.10	50
Bangladesh	0.03	30
Cambodia	0.01	20
China	0.08	38
India (cigarettes)	0.28	75
Pakistan	0.21	73
Sri Lanka	0.25	24
Vietnam	0.04	36
Zambia	0.20	30
Zimbabwe	0.34	80

Source: Marketfile and World Bank Tobacco Survey 1989–1995.

brands with a higher yield of nicotine and tar. This has been interpreted by some as an increase in the quality of the average cigarette consumed (Barzel 1976; British American Tobacco 1994; Sobel and Garrett, 1997).

Some countries may favor *ad valorem* excises (or specific excises with several quality bands) if the cheaper brands of cigarettes are domestic products and the prestige brands are imported (or produced locally by foreign-controlled companies). *Ad valorem* excises in this situation will give greater protection to domestic producers. When there are large quality differentials between domestic and imported excisable products, import duties can be imposed on the imported product to offset the inherent effect that a specific excise is 'bad' for low-priced (lower quality) domestic production. When customs duties are imposed for protection, specific excises can be imposed on both domestic production and imports.

Specific excises have another advantage. They are easier to administer because it is necessary only to determine the physical quantity of the product taxed, and not to determine its value. An exception to this general rule would be situations where the government controls the retail price of the excised good and the price is changed only a few times a year. These taxes are generally collected at the manufacturing, wholesaling, or importing stage. Specific taxation, however, does require a precise definition of what constitutes 'one unit' of quantity. International experience suggests, for example, that it is easier to administer a cigarette excise if the unit of quantity is 1000 cigarettes than if the unit of quantity is a kilogram of fine cut tobacco.

Under *ad valorem* taxation, determining the value is particularly difficult when taxpayers use abusive transfer prices to reduce their tax liabilities. For example, if the *ad valorem* cigarette excise is a percentage of the manufacturer's price, the manufacturer may sell cigarettes to a related marketing company at an artificially low price, thus reducing its excise liability. It is just this problem that led the Philippines in 1996 to abandon *ad valorem* taxes on cigarettes in favor of specific excises. Similarly, as part of its 1996 tax reforms, the Russian Federation unified the excises on imported and domestic products, and adopted specific excises for cigarettes. Until then, specific excises had been imposed on the domestic production of cigarettes but imports had been subject to *ad valorem* excises.

The valuation problem of *ad valorem* taxation should not be overstated, however. The tax administration can be given the authority to make price adjustments in situations where under-pricing of excisable goods has reduced the excise tax base, and, for some products, the value is fairly readily determinable. For example, a solution to the valuation problem is to impose the *ad valorem* cigarette excises, which are collected from the manufacturer or importer, on the maximum retail price that is specified by the manufacturer and printed on the package. Penalties are imposed on any sales of cigarettes at prices in excess of the maximum retail price. This approach to *ad valorem* taxation may be cumbersome or unworkable if prices are changing rapidly as it creates a problem regarding the inventory of packaging materials pre-printed with the retail price. Another possible solution would be to impose the excise at the retail stage where most sales would be to final consumers. However, this solution would create serious problems for tax administration, as there are many more retailers than there are manufacturers and importers.

International experience indicates that *ad valorem* taxes keep pace with inflation better than specific taxes. For example, in the United States, the federal specific tax on cigarettes remained unchanged (at 8 cents a pack) for 30 years, although states were regularly increasing their rates. *Ad valorem* taxes, however, are no guarantee that tax revenues will keep pace with inflation. Governments can adjust *ad valorem* rates to out-pace or lag inflation.

Specific taxes can keep pace with inflation if they are automatically adjusted by reference to the consumer price index (CPI). The CPI is the preferred index because once issued it is not revised, unlike some other price indicators such as the GDP deflator. Moreover, the concept of the CPI adjustment is judged to be understood by the public. Alternatively, specific excises could be adjusted to changes in the dollar or ECU exchange rate. However, it should be recognized that domestic currencies can appreciate relative to the dollar or the ECU, and when this occurs, excise rates, expressed in the domestic currency, would be reduced.

Ad valorem tax rates can be specified on a tax-exclusive basis (that is, net of tax) or a tax-inclusive basis (i.e. gross of tax). At one level it does not matter which way the *ad valorem* rates are specified as it easy to translate a tax-exclusive rate into a tax-inclusive rate or vice versa. For example, a 100% tax-exclusive rate is exactly equivalent to a 50% tax-inclusive rate.[2] However, in countries other than the former Soviet Union, excise rates usually are specified on a tax-exclusive basis because these rates are more transparent than tax-inclusive ones, especially when considering excise rates in conjunction with rates for the VAT and trade taxes that are normally expressed in tax-exclusive terms. Some countries collect excises from manufacturers and importers but impose them on the retail price. The retail price may be fixed by the government or it could be the manufacturers' suggested price of the maximum retail price set by the manufacturer. When the tax is imposed on the retail price, the tax may be expressed in tax-inclusive terms. The use of tax inclusive rates in the former Soviet Union may have reflected the old view that the final price is given and the excise tax should capture a share of the margin. In contrast, an excise tax in a market economy is treated as a cost added onto the sales price, which is easier for consumers to grasp if the excises are specified on a tax-exclusive basis.

On balance, given the weak tax administrations in most developing and transition countries, specific excises on cigarettes automatically adjusted for inflation should be preferred to *ad valorem* excises. These specific taxes could be adjusted *automatically* whenever the CPI has increased by more than, say, 5% since the previous adjustment. It is critical that the inflation adjustment be automatic: that is, it should be made by administrative order, and should not require a decision by an executive agency or approval by a legislative body.

Finally, in countries where the production and sale of tobacco products is monopolized by the state, the taxation of these products may be less obvious, but nonetheless important. Rather than levying a specific or *ad valorem* tax, the government collects revenues by increasing the prices of the tobacco products it produces and/or distributes. The indirect taxation resulting from a state monopoly on tobacco products can generate substantial government revenues from tobacco. For example, in Taiwan, the

[2] If t_n is the tax inclusive rate and t_e is the tax exclusive tax rate, both expressed in percentage terms, then $t_n = 100t_e/(100 + t_e)$ and $t_e = 100t_n/(100 - t_n)$.

government historically used its monopoly on opium, salt, camphor, wine, and tobacco products to generate significant revenues. Hsieh and Lin (1998) compared the profits earned by the Taiwan Tobacco and Wine Monopoly Bureau (TTWMB) to the average return on assets for the top 1000 firms in Taiwan (their measure of normal economic profit), to get an estimate of the excess profits earned by the state monopoly. For the period 1985–96, they estimate that the TTWMB's excess profit rate, a measure of the indirect tax associated with the government monopoly, was in the range between 28% and 51%.

17.2.4 Smuggling

If raising revenue is the sole justification for tobacco excises, one must recognize that some balance is required, at least in some low-income and middle-income countries where demand for tobacco products is relatively less inelastic and where smuggling may be more problematic. 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. Consider Zimbabwe, for example, where cigarette demand has been estimated to be relatively more elastic than in high-income countries (although still inelastic), with a price elasticity of demand of -0.85. For most of the past two decades, tobacco taxes as a percentage of price and tobacco tax revenues generally moved in the same direction. The exception to this was in 1984 when a sharp increase in cigarette taxes led to a significant decline in tax revenues. Part of this decline in revenue almost certainly reflects the substantial smuggling of cigarettes into Zimbabwe after the tax increase.

If the excise rates are set at very high levels, there may be a negative impact on revenues from other taxes such as income taxes and value-added taxes. Additionally, organized crime benefits from excise taxes that are higher than the government is willing and able to enforce and than the public is willing to support. What constitutes 'high' is difficult to determine, but taxes that account for 80% or more of cigarette pack price in some countries have not resulted in significant problems from smuggling. Overall, the evidence suggests that, when setting tobacco excise tax rates, key factors that must be considered in reducing the risk of smuggling include the purchasing power of local consumers, tax rates in neighboring markets, and the effectiveness of the tax authority to enforce compliance. For more detailed discussions of smuggling, see Merriman *et al*. (Chapter 15) and Joossens *et al*. (Chapter 16). In general, the more appropriate response to the threat of smuggling is the adoption and implementation of strong measures to counteract the smuggling itself.

17.3 Tax administration[3]

Tobacco excises are generally administered similarly to customs duties. If collected at the border, then the customs procedures apply directly. However, even the tax on domestic producers follows procedures analogous to customs, with the producer's facility being analogous to a customs warehouse. To ensure that all tobacco products are

[3] This section draws heavily on technical assistance reports and notes prepared by James Walsh and Katherine Baer of the Fiscal Affairs Department of the IMF.

covered by the excise schedule, countries may choose to define the various excises by reference to the numbers of the Harmonized System that has been adopted for tariff classification purposes and that is used by most of the trading nations of the world (Hussey and Lubick 1996).

The control of excise tax collections should be comparatively easy in relation to other taxes, particularly where there are only a small number of large excise taxpayers. Nevertheless, the administration of excises, like other taxes, requires an integrated strategy for taxpayer registration, filing and payment, collection of overdue taxes, audit, appeals, and taxpayer services. In high-income countries, excises can be administered by relying on the taxpayer to submit tax returns and then auditing the taxpayer's books of account. In low-income and middle-income countries, however, the effective enforcement of excises on tobacco products will require much greater physical control over the products.

The high degree of compliance with excise taxes that is experienced in many high-income countries is based, at least in part, on the maintenance of a professional relationship between the taxing authority and the taxpayer. Development of such professional relationships should be part of the overall strategy to strengthen tax administration and tax compliance.

17.3.1 Registration and licensing

Given the importance of tobacco excises for a country's revenues, all importers on a commercial basis and all producers of these excisable goods should be required to register with the tax authority and obtain a license. In conformity with international trade practices, the licensing of importers of excisable goods should not discriminate against imports or be excessive.

Effective enforcement begins with a stringent licensing system to screen out individuals and businesses that are not likely to pay their taxes or conduct their operations in strict conformity with all laws and regulations. Before licenses are given, background checks on owners and operators may be appropriate if there is any suspicion of a criminal background or involvement with smuggling. Penalties for not obtaining a license should be relatively severe, thereby facilitating administration of the tax. The licensing system may be extended to wholesalers. In addition, retailers may be required to purchase products only from licensed importers, wholesalers, or producers.

17.3.2 Timing of tax liability and tax payment

Excises on tobacco products are usually levies imposed on the production or importation of these goods; they are not levies imposed on the final sale of the goods. With appropriate physical controls (discussed below), it is much easier to determine when goods were produced or shipped than when they were sold or paid for. Although the tax liability is fixed when the goods are imported or produced, countries may permit deferment of the payment of the tax, with suitable guarantees that the tax will be paid. A deferment can allow the timing of the tax payment to coincide roughly with the time that the consumer buys the product.

17.3.3 Bonding

It is recognized that producers may experience cash-flow problems if they are required to maintain inventories of excisable goods on a tax-paid basis. This problem can be alleviated if producers can purchase a bond or similar security to ensure that all tax liabilities are paid. When there are bonded production facilities, the tax liability can be imposed when the excisable goods are removed from the bonded facility (i.e. released for consumption) and not when they are produced. Thus a cigarette producer could manufacture cigarettes and place them in a bonded warehouse. Tax would be due when the production is removed from the bonded warehouse unless it is withdrawn under a transfer bond for transfer to another bonded production center for further processing or it is withdrawn under an export bond for export.

17.3.4 Physical controls

Governments that have effective tax administration systems ensure that shipments into and out of tobacco production facilities are controlled. The producer should make records available for inspection by the tax authority on a regular basis, either weekly or monthly. Periodically, the tax authorities must take stock of the products at hand and check against the taxpayer's production and shipment records. Control may also include checking inventory by counting cigarette packs. An employee of the company may perform the actual measuring under the supervision of a tax official. To help ensure integrity, the control officials should be rotated frequently among different locations and the supervisor should make surprise visits.

High-income countries have, in the past, adopted intensive physical controls on excisable goods. For example, whisky distilleries in Scotland once had official locks on their entrances, exits, and key areas of the production process that were vulnerable to unlawful extraction. Each distillery had a resident excise officer who lived in a provided house next door to the distillery, and no activity could take place without the officer being present to unlock the locks. Similarly, in the United Kingdom, each bonded warehouse used to have a resident officer who had to unlock and lock the warehouse. Now, the United Kingdom relies on the warehouse keeper to exercise day-to-day control with official control based on spot checks and systems of audit. Some developing countries might need to consider similarly intensive controls on tobacco products. As in all such systems, however, the potential for fraud by the excise officer would have to be considered.

17.3.5 Use of stamps

Excise stamps are another method of ensuring payment of excise tax and ensuring that goods for which the tax appropriate for one jurisdiction has been paid do not get shipped to another. These stamps can be sold to the taxpayer, allowing the government to collect its money in advance. Alternatively, the stamps can be provided to bonded producers, with payment delayed until the excise would otherwise be payable. Stamps that represent the full payment of the excise are particularly effective for the payment of specific excises. If the price of the stamps does not represent the full payment of the

excise, as in the Russian Federation, the stamps can still be used to represent payment of excises. However, the tax authority, by requiring excise taxpayers to account accurately for the storage and use of stamps, must ensure that the full excise tax is paid on products bearing stamps. In this situation, stamps can serve to complement other administrative programs to help determine the tax liabilities of producers. In the case of *ad valorem* excises, different stamps are needed for each value of the excised good. In the case of cigarettes, manufacturers can apply the excise stamp directly to the pack as part of the manufacturing process. It can then be applied under the cellophane.

The introduction of stamps involves some costs for the producers of the excised goods, both in terms of the labor and equipment needed to apply the stamps, and the slower production lines that result from the application of the stamps. Stamping machines, for example, may cost in the region of US$40 000 each and some large taxpayers may require as many as 100 stamping machines. Stamps impose an additional cost on producers in that they lose flexibility: once stamped for one national market the product cannot than be shipped instead to another.

If a country is going to adopt excise stamps, then it must control both the excisable good and the stamps. In many countries, the excise stamps are re-used. In some countries, stamps have been easy to counterfeit. To limit counterfeiting, stamps should be of high quality, difficult to duplicate, serially numbered, and adhere to the package so that they will be broken when the package is opened. Stamps will serve little purpose in control unless their utilization is monitored at the retail level and retailers believe that the stamp program is being strictly enforced. There must be strong penalties or criminal sanctions for producing or possessing counterfeit stamps and for persons who deal in illicit products. Similarly, it should be an offence for a retailer or wholesaler to possess tobacco products that do not bear authentic stamps. Governments need to have the authority to revoke the operating licenses for retailers and wholesalers who are repeat offenders.

17.3.6 Refunds and credits

The excise law should provide for a refund or credit of excise tax previously paid on a product that is destroyed prior to being marketed or that is returned to the manufacturer. In addition, if excise stamps are used, stamps destroyed or damaged in transit or in the manufacturing process should be fully credited to the manufacturer. In these instances, there is no excisable sale or use of the product.

17.3.7 Floor stocks tax

To limit the opportunities for evasion and to ease administration, tobacco excises, as discussed earlier, should be levied at the manufacturing stage. However, whenever excise rates are increased, a tax can be imposed on the 'floor stocks', of the excised goods held by distributors and retailers on the date of the tax increase. This 'floor-stocks tax' limits the downstream windfalls that can result from tax increases that take effect on price immediately, even when distributors and retailers are holding inventory that was taxed at the previous lower rate. A floor-stocks tax is not needed every time

an excise rate is increased, only when the rate increase is significant. Also, any floor-stocks tax should exempt a *de minimis* holding of inventory.

17.4 Tax rates and revenues

We turn now to the discussion of the revenue-generating potential of tobacco taxes. A key question is the level at which tobacco tax rates should be set. If tobacco excises are viewed as an internalization of the social costs of smoking (see Chapter 4 and Chapter 6), one could attempt to measure this cost and to set the tax rates accordingly. If the purpose of the excise is to deter the consumption of tobacco, one could estimate the effect of higher prices on the demand for tobacco, and set the tax rate to reduce consumption to target levels in the short and longer term. As discussed elsewhere, however, the factors that govern the determination of optimal taxes are quite complex and will vary, depending on what the taxes are intended to accomplish (see Chapter 10 for a lengthier discussion of these issues). Historically, however, taxes on cigarettes and other tobacco products have been seen more simply as an efficient source of revenues, and their design has been driven primarily by this motive.

17.4.1 European Union tax rates and transition economies

The tax rates levied on tobacco products in the European Union (EU) may provide a benchmark for certain transition economies in Central and Eastern Europe, and the former Soviet Union for the following reasons:

(1) the EU is the largest trade partner of these economies, and is likely to become increasingly so;
(2) the EU raises substantial tax revenue from excises; and
(3) the EU rates are a demonstration of what can be supported and accepted by market economies within a European culture.

The EU requires member countries to impose minimum rates, subject to certain agreed derogations (Table 17.2). The EU originally proposed, in its White Paper on *Completing the Internal Market*, that the excise rates on alcohol, tobacco, and petroleum products within the EU should be fully harmonized (Commission on the European Communities, COM(85)). When agreement could not be reached on harmonized rates, the EU in 1992 adopted minimum rates that were set sufficiently low that most countries did not have to increase their excise rates. At the end of 1998, excises on cigarettes in the EU countries ranged from 34 ECU/1000 cigarettes in Spain to 156 ECU/1000 cigarettes in the United Kingdom (Table 17.3)

17.4.2 Tobacco excise tax revenues

Tobacco tax revenues have accounted for more than 10% of total excise tax revenues and more than 1% of total tax revenues in many countries (Table 17.4). The share of tobacco taxes in total tax revenues and excise tax revenues strongly depends on the proportion of the cigarette pack price that is due to excise tax, the amount of cigarette

Table 17.2 Minimum tobacco excise duty rates in the European Union

Tobacco products	Amount or rate (in ECU)
Cigarettes	57% of retail sales price
Fine cut smoking tobacco	30% of retail selling price of ECU 20/kg
Cigars and cigarillos	5% of retail selling price of ECU 7/1000 items or ECU 7/kg
Other smoking tobacco	20% of retail selling price or ECU 15/kg

Source: Commission of the European Communities, COM(95) 285 final, September 13, 1995. Rate consists of specific plus ad valorem rates, excluding VAT. Retail sale price includes all taxes and refers to cigarettes of the most popular price category. Each member State's excise duty on cigarettes must consist of two parts; one *ad valorem*, and one specific, with the specific element representing between 5% and 55% of the total tax burden (excise plus VAT) of the most popular category of cigarettes sold in that member State.

Table 17.3 Cigarette excise yield in EU Countries, January 1, 1995

Member States	Excise yield/1000 cigarettes (in ECU)
Austria	66.35
Belgium	74.48
Denmark	123.59
Finland	108.74
France	85.62
Germany	76.29
Greece	55.52
Ireland	120.11
Italy	55.65
Luxembourg	52.53
Netherlands	68.98
Portugal	56.86
Spain	33.90
Sweden	107.55
United Kingdom	155.99

Source: European Commission, *Excise Duty Tables* (December 1998).

expenditures, and the other taxes paid for goods and services as a proportion of income.[4] As the data in Table 17.4 illustrate, taxes that account for a significant share of price can be supported and accepted by market economies and can generate significant revenues.

[4] TER/TTR = (TER/CSC) ∗ (CSC/GDP) ∗ (GDP/TTR) (*denotes 'multiplied by')
Where: TER (Tobacco Excise Revenue) = number of cigarettes consumed ∗ tax rate, and TTR (Total Tax Revenue) = tax revenues from excise taxes (including tobacco excises), and other goods and services. CSC (Consumer Spending on Cigarettes) = number of cigarettes consumed ∗ cigarette price, and GDP = Gross Domestic Product. Similarly the percentage share of cigarette excise tax revenue in excise tax revenue is equal to:

TER/ER = (TER/CSC) ∗ (CSC/GDP) ∗ (GDP/TTR)∗ (TTR/ ER), where ER = Excise Revenue.

Table 17.4 Tobacco excise tax rates and revenues as % of total tax and excise tax revenues for countries by income group, 1994–95

	Cigarette excise as a percentage of	Tobacco excise tax revenues as a percentage of:	
	price	Total tax revenues	Excise tax revenues
High-income			
Australia	65	3.38	28.00
Austria	73	0.16	2.58
Denmark	84	2.03	18.84
Finland	73	2.03	12.26
France	75	0.37	5.18
Germany	72	1.38	11.89
Japan	60	0.02	0.34
Korea, Rep.	60	3.46	27.54
Netherlands	72	1.44	21.30
Norway	78	1.76	10.37
Spain	72	2.37	24.69
Sweden	69	1.63	12.23
Switzerland	52	1.69	73.61
UK	78	3.23	25.38
US	30	0.44	12.50
Upper-middle			
Argentina	70	4.34	36.89
Brazil	75	7.37	66.23
Chile	70	4.10	40.82
Croatia		0.82	6.76
Greece	73	8.69	35.31
Hungary	42	0.02	0.21
Mexico	60	1.41	13.10
San Marino		3.35	10.58
Poland	39	3.26	28.27
Seychelles	44	3.71	
South Africa	33	1.15	22.38
Uruguay	60	2.64	23.27
Lower middle-income			
Bulgaria	42	3.63	36.58
Colombia	45	0.91	17.73
Costa Rica	75	1.58	12.67
Egypt Rep.	57	1.34	6.58
Estonia	70	1.29	14.87
Indonesia	30	3.38	68.57
Lithuania		0.16	1.42
Romania		0.20	4.73
Turkey	42	0.21	1.90
Venezuela	50	2.30	56.93
Low-income			
China	40	2.79	15.22
India	75	2.43	6.53
Kenya		0.09	0.63
Nepal	73	6.37	75.68
Pakistan	73	0.11	0.43
Zambia	30	0.04	0.23
Zimbabwe	80	1.17	22.81

Source: unpublished data, IMF, WHO, and the World Bank Tobacco Survey.

17.4.3 Potential revenue from cigarette excises

When forecasting excise revenues, it is necessary to consider whether the excises are *ad valorem* or specific, and, if specific, whether they are indexed for inflation. To estimate the revenue effect of changes in excise rates, the following reasonably straightforward calculation is required: multiply the tax base by the increase in the tax rate and adjust this for changes in the tax base. To illustrate, assume initially that a specific excise tax of 10 rupees per pack represents 50% of the retail price of cigarettes (i.e. 20 rupees per pack). If sales were 10 million packs per year, excise revenue would be 100 million rupees. If the excise is increased by 10% to 11 rupees per pack, the price of cigarettes will rise by 5% to 21 rupees per pack. If the demand elasticity for cigarettes is –0.8, the 5% increase in the price of cigarettes will reduce the demand for cigarettes by 4% to 9.6 million packs per year. Thus tax revenue will increase by 5.6 million rupees (11×9.6 million $- 10 \times 10$ million), or by 5.6%.

The estimates from a similar exercise conducted for 70 countries are presented in Table 17.5. These estimates were obtained using data obtained from the World Health Organization (WHO 1997) and a commercial database (Market Tracking International 1999) on cigarette prices, taxes as a percentage of price, and current cigarette consumption. Based on these data, the impact of a 10% increase in cigarette taxes on cigarette consumption and cigarette tax revenues is estimated. Based on the literature on cigarette demand (see Chapter 10), the short-run price-elasticity of demand for cigarettes is assumed to be –0.8 in low-income and middle-income countries and –0.4 in high-income countries. In addition, the tax increase is assumed to be fully passed on to smokers; that is, the 10% increase in the tax is assumed to lead to an x% increase in price, where x is equal to one-tenth of the percentage of cigarette price accounted for by taxes.

These estimates imply that a modest 10% increase in cigarette taxes would lead to a reduction of just over 3% in total cigarette consumption in these 70 countries. Moreover, total cigarette tax revenues would rise by nearly 7% as a result of this tax increase. Given the relatively more elastic demand in low-income and middle-income countries, cigarette consumption would fall by more in these countries (3.45%) than it would in high-income countries (2.24%). While cigarette tax revenues would rise significantly in all countries, the percentage in low-income and middle-income countries would be somewhat smaller (4.8%) than that in high-income countries (7.2%), due to the relatively larger decline in consumption in these countries and the lower share of cigarette price accounted for by excises. In general, the reduction in cigarette consumption is smaller and the rise in revenues larger when tax accounts for a relatively smaller share of price, all else being equal. Larger tax increases would lead to larger reductions in consumption but continue to generate significant increases in tax revenues.

A few caveats should be noted concerning the revenue-generating potential of tax increases on cigarettes and other tobacco products. First, in the exercise presented above, the price-elasticity of demand was assumed to be constant. Changes in this assumption would produce different estimates for the effects of changes in tobacco taxes on demand and tax revenues. If a linear demand curve is assumed, then the price-elasticity of demand will rise as taxes and prices rise, implying more rapid reductions in demand and smaller increases in tax revenues than estimated when the price-

Table 17.5 Estimated impact of a 10% increase in cigarette taxes on cigarette consumption and cigarette tax revenues, various countries

Country	Change in cigarette consumption (%)	Change in cigarette tax revenues (%)
Lower middle-income		
Belize	–2.24	7.54
Bolivia	–4.88	4.63
Bulgaria	3.33	6.33
Colombia	–3.60	6.04
Costa Rica	–6.00	3.40
Dominican Rep.	–1.07	8.82
Egypt	–4.56	4.98
El Salvador	–3.40	6.26
Estonia	–5.60	3.84
Jamaica	–3.36	6.30
Moldova	–1.49	8.36
Panama	–4.80	4.72
Paraguay	–0.80	9.12
Philippines	–5.06	4.44
Slovak Rep.	–2.76	6.97
Thailand	–4.96	4.54
Turkey	–3.36	6.30
Low-income		
Albania	–5.60	3.84
Armenia	–4.00	5.60
Bangladesh	–2.40	7.36
Cambodia	–1.60	8.24
China	–3.23	6.45
Honduras	–0.80	9.12
India	–6.00	3.40
Indonesia	–2.40	7.36
Nepal	–5.86	3.56
Pakistan	–5.84	3.58
Sri Lanka	–1.91	7.90
Vietnam	–2.88	6.83
Zambia	–2.40	7.36
Zimbabwe	–6.40	2.96
High-income		
Australia	–2.60	7.14
Austria	2.92	6.97
Belgium	–3.00	6.70
Canada	–2.05	7.74
Denmark	–3.36	6.30
Finland	–2.92	6.79
France	–3.00	6.70
Germany	–2.88	6.83

Table 17.5 (*cont.*)

Country	Change in cigarette consumption (%)	Change in cigarette tax revenues (%)
Ireland	–3.00	6.70
Italy	–2.92	6.79
Japan	–2.40	7.36
Korea, Republic	–2.40	7.36
Netherlands	–2.88	6.83
New Zealand	–2.72	7.01
Norway	–3.12	6.57
Portugal	–3.24	6.44
Singapore	–2.92	6.79
Spain	–2.88	6.83
Sweden	–2.76	6.96
Switzerland	–2.08	7.71
Taiwan	–0.15	9.84
United Kingdom	–3.12	6.57
United States	–1.20	8.68
Upper middle-income		
Argentina	–5.60	3.84
Brazil	–6.00	3.40
Chile	–5.60	3.84
Czech Republic	–0.01	9.99
Greece	–2.92	6.79
Hungary	–3.39	6.27
Malaysia	–2.67	7.06
Mexico	–4.83	4.69
Slovenia	–5.04	4.46
South Africa	–2.66	7.07
Uruguay	–4.80	4.72
Poland	–3.14	6.55

Source: authors' calculations.

elasticity of demand is assumed to be constant. Indeed, this linear demand curve and the resulting rising elasticity would imply an inverted U-shaped relationship between tobacco taxes and tobacco revenues, where initial increases in taxes would lead to increased revenues but beyond some point, additional increases would lead to disproportionately large reductions in demand, thereby causing revenues to fall. In contrast, given that most studies conclude that the demands for cigarettes and other tobacco products are inelastic, assuming a constant elasticity of demand based on these estimates would imply that even very large increases in tobacco taxes would always generate increases in tax revenues. Either assumption could be questioned and, in reality, the revenue effects of a tax increase are likely to fall somewhere between the predictions obtained from the two. The impact of the assumption about the shape of the demand curve, however, is relatively small for the modest tax increase discussed above.

A second caveat is that, in the exercise presented above, and consistent with much of the empirical literature, it was assumed that an increase in tobacco taxes was fully passed on to consumers. The impact of tobacco tax increases on tax revenues will depend on how the tobacco industry responds to the tax increase. To some extent, given the monopoly power of firms in the industry, tobacco companies can adjust their pricing so that the resulting tax revenues fall short of their expected levels. As noted earlier, Townsend (1998) suggested that one disadvantage of an *ad valorem* tax system is that the tobacco industry might keep prices, and consequently tax revenues, below where they would otherwise be. Similarly, if tobacco companies use a scheduled tax increase as an opportunity for an oligopolistic price increase that is greater than the tax increase (as suggested by Harris 1987), then the greater-than-expected decline in demand would lead to a smaller-than-expected increase in tax revenues.

17.5 Conclusion

Countries that need to generate additional tax revenue often adopt increases in tobacco excise rates. In addition to the increased revenues, however, there are also health benefits from reduced tobacco consumption. In setting tobacco tax rates, governments need to take into account several factors, including the impact of smuggling, cross-border shopping, and duty-free purchases. It is in the interest of governments to reduce tobacco smuggling, not only to increase excise revenues but also to limit the loss of revenues from other taxes, including income taxes and value-added taxes, as underground transactions replace legal ones. Ultimately, tobacco excise tax rates should consider the purchasing power of the local consumers, rates in neighboring countries, and, above all, the ability and willingness of the tax authority to enforce compliance. As the exercise in this chapter demonstrates, increases in tobacco excise taxes can generate significant increases in tobacco tax revenues.

With respect to the structure of tobacco excises, countries should tax all types of tobacco—cigarettes, cigars, pipe tobacco, snuff or chewing tobacco, and hand-rolling tobacco. The best international practice is to impose excises on the destination basis under which imports are taxed and exports are freed of tax. Excises can be either specific taxes (based on quantity) or *ad valorem* (based on value). If a primary purpose of the excise is to discourage tobacco consumption, a strong case can be made for specific excises that would impose the same tax per cigarette. Specific taxes also are easier to administer, because it is necessary only to determine the physical quantity of the product taxed, and not its value. *Ad valorem* taxes, however, may keep pace with inflation better than specific taxes, even specific taxes that are adjusted fairly frequently.

The administration of domestic tobacco excises requires an integrated strategy for taxpayer registration, filing and payment, collection of overdue taxes, audit, and taxpayer services. Low-income and middle-income countries may need to treat tobacco production facilities as extra-territorial, and administer excises similar to customs duties. The tax authority is required to control shipments into and out of the production facility. Excise stamps can assist in ensuring the payment of excises and ensuring that goods that have paid the tax appropriate for one jurisdiction are not shipped to another. The introduction of stamps, however, involves some costs for producers of excised goods. Stamps will serve little purpose in control unless their utilization is monitored at the retail level.

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