

Chapter 5

The Economics of Smokeless Tobacco

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Introduction

Economic analysis of the smokeless tobacco (ST) market is relatively undeveloped compared to analysis of the cigarette market. Understanding economics of the ST market, such as the demand, pricing, and taxation structure for ST, is important for understanding tobacco control. This chapter summarizes the literature (written in or translated into English) and available economic data on ST in the context of two separate and distinct marketplaces: the modern market and the traditional market (defined below). The chapter also provides the first systematic overview of ST excise tax rates and points out the vast gaps in both economic data and economic research related to ST use.

Smokeless Tobacco and Cigarette Markets

The ST market is different from the cigarette market in several key aspects.

First, the cigarette market offers, in most cases, a relatively homogenized and consistent product within and between countries. A pack of Marlboro cigarettes purchased in Cameroon is similar to a pack of Marlboro cigarettes purchased in Canada or Cambodia. On the other hand, ST purchased in Sweden is very different in terms of ingredients and types of products from ST purchased in India or Sudan.

Second, although cigarettes are a legal product in every nation of the world (except Bhutan), the sale of ST has been effectively banned in nearly 40 countries,¹ most of which are in Europe or the Western Pacific. As a result, and because ST is not widely used in many nations, the consumption of ST is largely concentrated in a few specific regions of the world. Cigarettes, in contrast, are consumed in almost all parts of the world.

Third, ST markets in low- and middle-income countries are not yet dominated by multinational tobacco corporations; the products consumed in those countries are often homemade or manufactured within a fragmented network of small, locally owned businesses. The ST market in many high-income countries, however, has become more highly concentrated, with multinational tobacco corporations owning the largest share. This concentration among multinationals has implications for tobacco surveillance, the regulatory environment, and economies of scale.

Fourth, ST markets are much less regulated than cigarette markets, particularly in low- and middle-income countries, and this lack of regulation affects tax levels and the effectiveness of collecting taxes on smokeless tobacco.

Given the diversity and complexity of the ST market, we define two separate, broad categories: modern markets and traditional markets. Modern markets, primarily located in Scandinavia and North America, are characterized by the presence of multinational corporations and the predominance of standardized, commercially manufactured ST products (defined in chapter 3 as one form of premade ST product). Traditional ST markets are much less concentrated, trading a large variety of products made under loosely defined standards (which would include cottage industry products, as defined in chapter 3, and custom-made products). These markets can be found in South Asia, Central Asia, South America, and Sub-Saharan Africa. The best available estimates indicate that, by volume, 91.3% (648.2 billion tons) of the ST products sold worldwide (710.2 billion tons) are sold in traditional markets.² In contrast, the

monetary value of ST sales in modern markets (US\$7.882 billion) is higher than in traditional markets (US\$6.548 billion).² Estimates of the size of traditional markets are conservative, however, as they do not include some important markets such as Bangladesh.

Overall, ST sales represent approximately 2.2% of the value of the global tobacco products market.² Although this figure is projected to grow considerably, cigarettes have the majority share of the tobacco market.³

Globalization of Smokeless Tobacco Markets

The business outlook for ST markets was positive as of 2012. Growth was expected in both the modern and traditional ST markets, making ST a profitable investment for multinational tobacco companies, which have increased their presence in modern markets. For example, the leading U.S. cigarette manufacturers decided to expand into the ST market and acquired the two largest U.S. smokeless tobacco manufacturers: U.S. Smokeless Tobacco (acquired by Philip Morris USA in 2009) and Conwood (acquired by Reynolds American in 2006). In addition, the largest Swedish ST corporation, Swedish Match, entered the U.S. smokeless tobacco market in the early 2000s. By 2010, Altria (the American parent company of Philip Morris USA, which sold Philip Morris International in 2008) owned 56% of the U.S. ST market by volume, whereas Reynolds had 30.3% of the market share.^{4,5}

In addition to capturing most modern markets, the multinational corporations have attempted to enter traditional markets. For example, Swedish Match, Phillip Morris, and British American Tobacco (BAT) have tried (thus far unsuccessfully) to capture a portion of the massive Indian ST market, and Japan Tobacco International made inroads into the rapidly growing Nigerian ST market.⁶ If these efforts continue, traditional markets can be expected to start selling more standardized ST products.

It is difficult to accurately track the extent of the global ST trade because the United Nation's commodities trade statistics database, Comtrade, does not disaggregate ST products from other tobacco products that are being traded.⁷ Table 5-1 summarizes imports and exports for several important ST markets using data obtained from multiple sources. The major ST-exporting countries are India, Sweden, and the United States. The primary ST importers are Canada and Norway. Because the United States is not a Party to the World Health Organization Framework Convention on Tobacco Control (WHO FCTC) and therefore does not have an obligation to provide an FCTC Party report, which is the primary source of these data, the United States is not included in this table.

Table 5-1. Global smokeless tobacco trade in selected countries

Country	Product	Export (kg)	Import (kg)	Year	Source*
Sweden	Chew and snuff	1,752,600	5,614	2009	Johansson 2010 (76)
Canada	Smokeless tobacco	—	27,377,139	2008	Sabiston 2010 (16)
Norway	Swedish snus	—	1,101,720	2009	Lindbak & Wilson 2010 (45)
Norway	Chew	—	12,800	2009	Lindbak & Wilson 2010 (45)
Italy	Snuff	—	10,000	2009	Galeone 2010 (77)
Iceland	Snuff	—	19,953	2008	Guðmundsdóttir & Jensson 2009 (78)
Singapore	Snuff	—	90	2009	Taylor & Ling 2010 (79)
Singapore	Other smokeless tobacco products	—	10,400	2009	Taylor & Ling 2010 (79)
India	Chew	8,725,000	—	2007–2008	Tobacco Board 2011 (80)
India	Snuff	85,000	—	2007–2008	Tobacco Board 2011 (80)

*Numbers in parentheses correspond to full citations in the References at the end of this chapter.
Abbreviation: kg = kilogram.

Smokeless tobacco may also be traded illegally across borders.² Such illicit trade of ST may circumvent policies that ban the import and sale of ST products in certain nations and could be the source of the ST used in those nations. Although there are no estimates of the size of the illicit ST trade, customs authorities in several countries have reported confiscating illicit ST products. Data on ST seizures are compared with cigarette seizures in Table 5-2. Cigarettes are confiscated much more frequently than ST products in the few modern market countries for which data are available. There are also reports of illicitly traded counterfeit ST products, but evidence of the practice is scarce.^{8,9}

Although tax is most likely not collected on illicitly traded ST products, much larger tax leakage is assumed to occur in the domestic markets, primarily in traditional markets, due to weak tax administration and the challenges associated with collecting ST in a highly diversified market.¹⁰

Table 5-2. Seizures of illicit tobacco products in selected countries

Country	Smokeless tobacco seized	Cigarettes seized	Year	Source*
Modern markets				
Finland	54 kg	16,044 kg	2009	Hirvonen & Annala 2009 (81)
Malta	4 kg	25,197,477 units	2010	Kingswell & Vincenti 2011 (82)
Sweden	928 kg	56,900,000 units	2009	Euromonitor 2010 (2); Johansson 2010 (74)
Traditional markets				
Algeria	4,000,000 kg	—	2008	Euromonitor 2010 (2)
Bhutan	1,823 kg	472,600 units	2010	Norbu 2010 (83)
Brunei Darussalam	2 kg	58 kg	2009	Haji 2010 (84)
India	21,109,000 kg	214,205,000 kg	2009	Desiraju 2010 (85)
Nepal	147,504 kg	—	2005	Government of Nepal 2007 (86)
Oman	126,777 kg	17,743,000 units	2006	Al-Lawati 2007 (87)

*Numbers in parentheses correspond to full citations in the References at the end of this chapter.
Abbreviation: kg = kilogram.

Modern Markets

Geography and Characteristics

Canada, the United States, and the Scandinavian countries of Northern Europe, represent the modern ST marketplace, each country having a sizeable, predominantly male population of ST users.

Although the rate of ST use is much lower in the United States (3.6% of the adult population in 2012) than in Sweden (17.0% of adults in 2010) (see chapter 2), the population of the United States is more than 300 times larger than Sweden's, thus the United States has significantly more ST users.^{11,12}

In contrast, 18.1% of American adults were current cigarette smokers in 2012, representing a market of more than 42 million cigarette users.¹³ However, ST is a growing segment of the U.S. tobacco market, for which marketing expenses more than doubled between 2005 and 2008.^{4,14} The most commonly used ST product in the United States is moist snuff, known as “dip.” Newer forms of ST, like snus and dissolvables are available in the United States, whereas sales of the oldest American ST product, chewing tobacco, continue to decline.¹⁵ Two cigarette multinational corporations, Altria and Reynolds American, dominate the U.S. market, and the Swedish multinational ST corporation Swedish Match maintains a significant presence.

The Canadian ST market closely resembles the U.S. ST market in terms of its product selection and distribution system. About 2.4% of adult Canadian men aged 15–24 consumed some form of ST in 2008.¹⁶ As in the United States, ST is consumed primarily in the form of moist snuff; chewing tobacco is much less popular. Canada does not manufacture ST products but imports most of them from the United States.¹⁷ The leading distributor is the National Tobacco Company, which supplied 82% of Canada's ST

market in 2009; Imperial Tobacco Canada supplies the remainder of the market.¹⁷ Because most ST imports come from the free-trade zone set up by the North American Free Trade Agreement, import duties are rarely levied.¹⁶ Similar to the United States, Canada was classified by business analysts as a growth market for ST products.¹⁸

With few exceptions, ST is an illegal product in European Union (EU) countries. The EU's Tobacco Products Directive¹⁹ on oral tobacco products prevents the marketing and sale of "oral tobacco," which they define as "all products for oral use, except those intended to be smoked or chewed, made wholly or partly of tobacco, in powder, ... sachet portions, ... or in a form resembling a food product."^{19,p.4} This narrow definition of "oral tobacco" effectively bans snus and moist snuff, but chewing tobacco and nasally consumed ST (dry snuff) can be sold legally in all EU countries.²⁰

Sweden, the only EU country exempt from the Directive on oral tobacco products, is an important and well-defined modern market for ST. Approximately 17% of Swedes consume ST (26% of males and 7% of females) (chapter 2). Swedish Match has a dominant share of the market (85.8% of retail volume) followed by Fiedler & Lundgren/British American Tobacco (9.2%) and Skruf Snus (2.8%).²¹

Norway, which is not an EU member, has about 10% ST use prevalence (17% of males and 5% of females use ST) (chapter 2). The Norwegian ST market is dominated by Swedish Match, which had an 80% share of the market value in 2009. Other multinationals with a market presence are British American Tobacco and Imperial Tobacco.²²

Because the EU Directive does not ban chewing tobacco, there is still a market for chewing tobacco products in the United Kingdom, particularly "traditional" chewing tobacco products that are commonly used in South Asia.²³ The vast majority of Britons who consume ST products are South Asian immigrants, who produce and distribute ST in a way that closely resembles traditional markets in their countries of origin.²⁴⁻²⁶ The general regulatory environment of the UK, however, is similar to that in other modern ST markets.

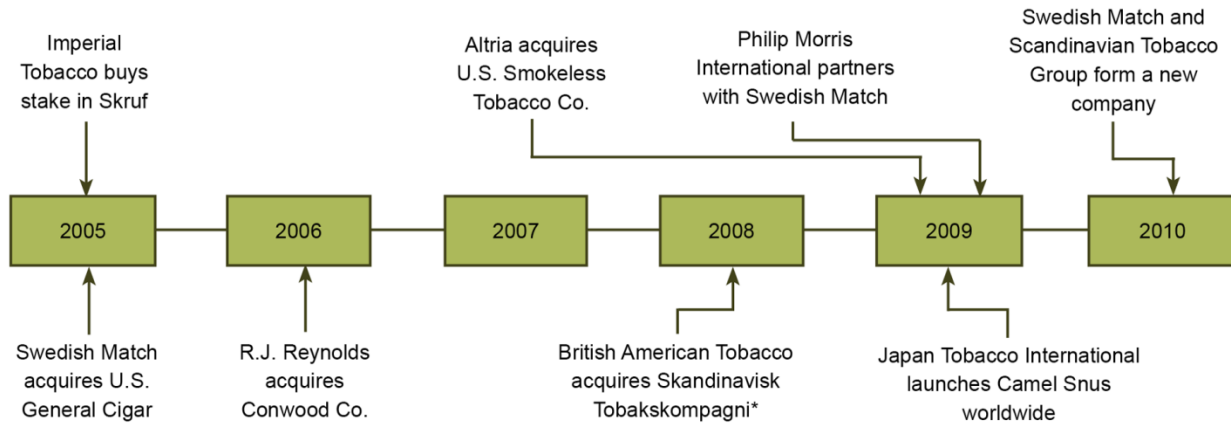
A mixed ST market exists in South Africa, where major multinational cigarette corporations control the manufacture and distribution of ST products usually sold in a manner that resembles traditional markets.

Corporate Influence

The multinational tobacco companies British American Tobacco, Phillip Morris International, and Swedish Match have begun to consolidate the modern ST market, a process reminiscent of the consolidation of the tobacco industry into the American Tobacco Company (also known as the "Tobacco Trust") at the turn of the 20th century.^{27,28}

Figure 5-1 illustrates developments since 2005 in the ownership of modern ST markets.²⁹⁻³³ Japan Tobacco International, British American Tobacco (a major stakeholder in Reynolds American), Imperial Tobacco, and Phillip Morris International have invested in both cigarette and ST markets, although cigarette sales are still their primary focus. Swedish Match has an international presence in the ST marketplace, but not in the cigarette marketplace. As a result of the consolidation process, the modern markets are dominated by five multinational tobacco corporations.³⁴

Figure 5-1. Consolidation of the modern smokeless tobacco market, 2005–2010



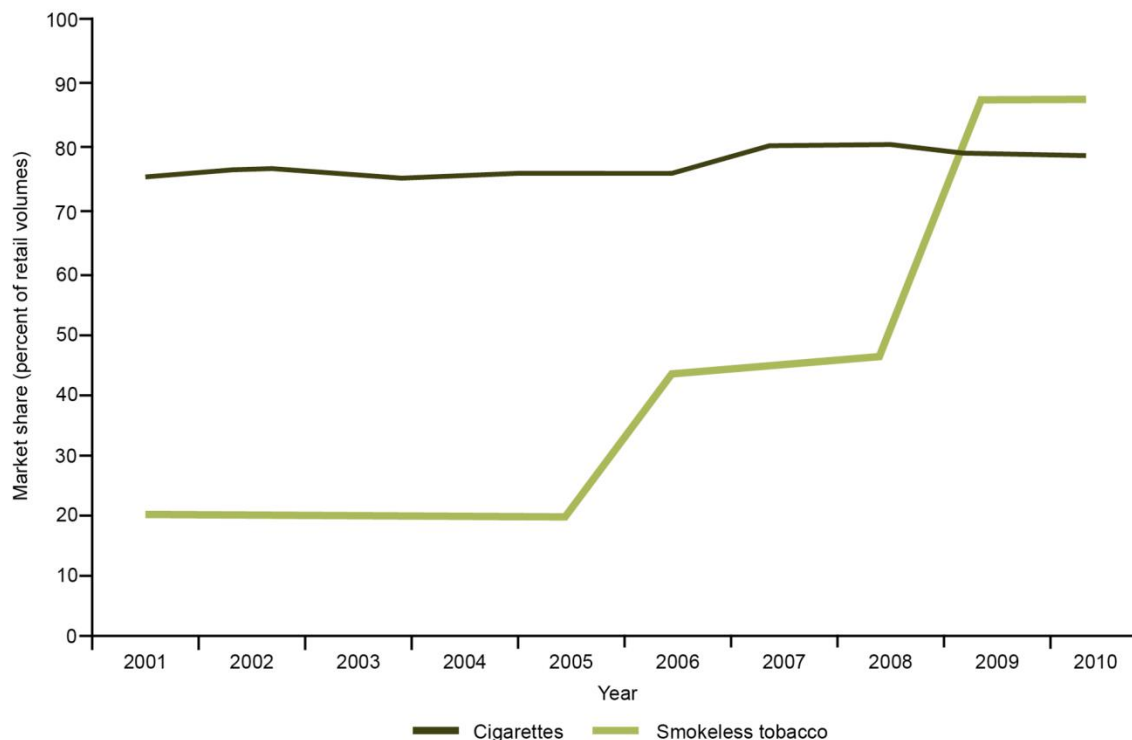
*In 2008, Skandinavisk Tobakskompagni changed its name to Scandinavian Tobacco Group.

Figure 5-2 shows the change in these five multinational corporations' combined market shares in ST in the United States between 2001 and 2010, and contrasts them with the combined cigarette market shares of the four multinationals, that sell both cigarettes and smokeless tobacco. By 2010, ownership of the ST market was more concentrated than ownership of the cigarette market.³⁴ Consolidation accompanied by homogenization of ST products allows for economies of scale, improves efficiency, and reduces production costs.³⁵

Entities operating in the modern ST marketplace are trying to market novel nicotine delivery products as distinct from tobacco products, both as a response to increasing regulation of the tobacco market and in an attempt to broaden the appeal and user base of ST.

Tobacco companies are also beginning to brand newly introduced ST products under the same names as popular cigarette brands.^{36–40} This trend is most notable in the United States, where moist snuff and dissolvable tobacco products with names like Marlboro (Altria Group) and Camel (Reynolds American) have been introduced. In addition to stimulating sales of products bearing the Marlboro or Camel brand, this branding is apparently intended to encourage Marlboro/Camel cigarette smokers to substitute or supplement their use by using Marlboro or Camel ST products (see chapter 6).

Figure 5-2. Combined shares of the U.S. cigarette and smokeless tobacco markets held by multinational tobacco corporations, 2001–2010



Source: Authors' calculations based on data from Euromonitor International 2011 (15).

Tax

Several types of taxes are levied on ST products. An excise tax is the most important because it can be used by policymakers to achieve public health goals.⁴¹ Excise taxes, similar to sales taxes, are internal taxes that can change the price of ST products relative to other consumer goods and make ST less affordable for the consumer, thereby reducing the quantity of ST demanded. There are two types of excise taxes: specific and ad valorem. A specific tax is charged as a fixed monetary value per physical unit of product. In the case of ST, the physical unit is usually a kilogram (e.g., in Iceland) or a smaller unit such as a sachet (in Madagascar). An ad valorem tax is charged as a percentage of the value of a product. The value of the product can be defined as the retail price, the manufacturer's price, or by some other measure. In addition to excise tax, most ST products also carry taxes that are levied on other consumer goods, such as sales, consumption, or value-added taxes, and customs duties, which are imposed on imports.

Table 5-3 presents ST tax rates in selected modern markets. These taxes are imposed on a national level and do not include any subnational taxes.

Table 5-3. Smokeless tobacco tax rates in modern market countries (per year)

Country	Specific excise (US\$/kg)	Ad valorem tax	Type of product	Year	Source*
Albania	15.21		Snuff & chew	2011	Tobacco Merchants Association (TMA) 2011 (46); General Directorate of Tax (Albania) 2002 (88)
Armenia	4.01		Snuff & chew	2011	TMA 2011 (46); Tax Service (Armenia) 2000 (89)
Bulgaria	95.34		Chew	2011	TMA 2011 (46); National Revenue Agency (Bulgaria) 2011 (90)
Canada	60.17		Snuff & chew	2011	Sabiston 2010 (16); TMA 2011 (46)
Croatia	7.40		Snuff & chew	2011	TMA 2011 (46)
Czech Republic	73.55		Snuff & chew	2011	Czech Tax Administration 2011 (91)
Denmark	44.05		Chew	2011	TMA 2011 (46); Skatteministeriat 2010 (92)
Denmark	11.23		Chew, snuff	2010	Skatteministeriat 2010 (92); Falk 2010 (93)
Estonia	43.04		Chew	2011	Alcohol, Tobacco, Fuel and Electricity Excise Duty Act (Estonia) 2009 (94)
Finland		60.00%	All	2010	Hiroven & Annala 2009 (81); Colliander 2009 (95)
France		32.17%	Chew	2011	TMA 2011 (46)
Georgia	11.93		Snuff & chew	2011	TMA 2011 (46); Ministry of Finance (Georgia) 2009 (96)
Germany		None	Chew	2011	TMA 2011 (46)
Iceland	42.17		Snuff	2009	Ministry of Finance (Iceland) 2009 (97)
Ireland		22.00%	Chew	2011	TMA 2011 (46)
Italy		24.78%	Chew	2011	TMA 2011 (46); European Commission 2002 (98)
Macedonia	31.42		Snuff & chew	2011	TMA 2011 (46); Official Gazette of the Republic of Macedonia 2010 (99)
Malta	45.97		Chew	2011	Justice Services (Malta) 2010 (100)
Mexico		30.40%	Snuff & chew	2010	Secretaria de Hacienda (Mexico) 2010 (101); Avila & Ajenjo 2010 (102)
Netherlands	34.48		Chew	2011	TMA 2011 (46); Government of the Netherlands 2002 (103)
Norway	168.92		Snuff & chew	2011	TMA 2011 (46); Customs and Excise Special Taxes Department (Norway) 2011 (44)
Poland		60.00%	Chew	2011	TMA 2011 (46)
Romania	116.20		Chew	2011	TMA 2011 (46)

Country	Specific excise (US\$/kg)	Ad valorem tax	Type of product	Year	Source*
Russian Federation	18.08		Snuff & chew	2011	TMA 2011 (46)
Serbia		35.00%	Snuff & chew	2011	TMA 2011 (46); Lazarevi & Stankovic 2011 (104)
Slovakia	96.06		Chew	2011	TMA 2011 (46); Ministry of Finance of the Slovak Republic 2009 (105)
Slovenia		0.00%		2008	Čakš et al. 2008 (106); Ministry of Finance (Slovenia) 2010 (107)
Spain		26.00%		2010	Hurtado & Fernández 2010 (108)
Sweden	64.18		Chew	2011	Skatteverket 2008 (42); TMA 2011 (46)
Sweden	52.78		Snuff	2011	Skatteverket 2008 (42)
Switzerland		5.00%	Snuff & chew	2010	Les autorités fédérales de la Confédération (Switzerland) 2010 (109); Grundlagen 2011 (110)
Ukraine	2.51		Snuff & chew	2011	TMA 2011 (46); Schlesinger & Dye 2010 (111)
United Kingdom	137.35		Chew	2011	HM Revenue and Customs 2011 (112)
United States	1.11		Chew	2011	TMA 2011 (46); Internal Revenue Code 2009 (113)
United States	3.32		Snuff	2011	TMA 2011 (46); Internal Revenue Code 2009 (113)

*Numbers in parentheses correspond to full citations in the References at the end of this chapter.
Abbreviations: kg = kilogram; TMA = Tobacco Merchants Association.

Smokeless tobacco is generally taxed at significantly lower rates than cigarettes (Table 5-4, Table 5-5). For example, the taxes on a standard pack of 20 cigarettes in Sweden was Swedish krona (SEK) 25.80 (US\$3.57) in taxes in 2010, compared to SEK 11.42 (US\$1.79) for a standard 34g pack of smokeless tobacco.⁴² This difference in tax policy is clearly illustrated by the share of excise tax in the retail price of a product: The excise tax on the most popular brand of cigarettes in Sweden represents 52% of its retail price, whereas the excise tax levied on the most popular brand of Swedish snus represents only 22% of its retail price.⁴³ A similar situation exists in Norway, where the excise tax on cigarettes reaches 52% of the retail price, whereas the excise tax on Swedish snus represents only 33% of the retail snus price.⁴³⁻⁴⁶ The lower level of ST taxes likely results from many factors, such as a lower priority on controlling ST consumption than cigarette consumption, or preferential treatment for domestically produced ST products over cigarettes sold by the multinationals. This contrasts sharply with the bans imposed by the EU, Australia, and New Zealand on the import and sale of ST products.

Table 5-4. Relative tax incidences of cigarettes and smokeless tobacco

Country	Tobacco type	Amount	Excise tax, LCU (US\$)
Sweden	Cigarettes	20 sticks ~ 20g	25.80 (\$3.57)
Sweden	Swedish snus	1 can ~ 34g	11.42 (\$1.79)
Country	Tobacco type	Amount	State tax (federal tax)
U.S.–Washington	Cigarettes	20 sticks ~ 20g	3.02 (\$4.03)
U.S.–Washington	Moist snuff, loose	1 can ~ 34g	3.03 (\$3.14)
U.S.–New Jersey	Cigarettes	20 sticks ~ 20g	2.70 (\$3.71)
U.S.–New Jersey	Moist snuff, loose	1 can ~ 34g	0.90 (\$0.99)

Abbreviations: g = grams; LCU = Local Currency Unit.

Note: Tax rates for Sweden are for 2008, and for the United States, 2010.

Sources: World Health Organization 2011 (43); Skatteverket 2008 (42); Boonn 2011 (51).

Table 5-5. Tax burden comparison between cigarettes and smokeless tobacco

Country	Specific excise on cigarettes (US\$/1,000)	Ad valorem tax on cigarettes (%)	Specific excise on smokeless tobacco (US\$/kg)	Ad valorem tax on smokeless tobacco (%)	Smokeless tobacco type
Albania	23.83	0.0	15.21		Snuff & chew
Armenia	13.47	0.0	4.01		Snuff & chew
Bulgaria	67.17	23.0	95.34		Chew
Canada	227.33	0.0	60.17		Snuff & chew
Croatia	32.30	33.0	7.40		Snuff & chew
Czech Republic	56.22	28.0	73.55		Snuff & chew
Denmark	110.13	20.8	44.05		Chew
Denmark	110.13	20.8	11.23		Snuff
Estonia	43.76	33.0	43.04		Chew
Finland	22.79	52.0		60.00	All
France	22.01	58.0		32.17	Chew
Georgia	16.38	0.0	11.93		Snuff & chew
Germany	107.82	24.7		None	Chew
Iceland	134.93	0.0	42.17		Snuff
Ireland	238.98	18.3		22.00	Chew
Italy	9.05	54.7		24.78	Chew
Italy	9.05	54.7			Snuff
Macedonia	2.12	35.0	31.42		Snuff & chew
Malta	28.66	50.0	45.97		Chew

Country	Specific excise on cigarettes (US\$/1,000)	Ad valorem tax on cigarettes (%)	Specific excise on smokeless tobacco (US\$/kg)	Ad valorem tax on smokeless tobacco (%)	Smokeless tobacco type
Mexico	3.16	46.2		30.40	Snuff & chew
Netherlands	120.03	20.5	34.48		Chew
Norway	348.10	0.0	168.92		Snuff & chew
Poland	47.84	31.4		60.00	Chew
Romania	63.37	22.0	116.20		Chew
Russian Federation	6.81	6.5	18.08		Snuff & chew
Serbia	11.51	35.0		35.00	Snuff & chew
Slovakia	68.23	24.0	96.06		Chew
Slovenia	24.73	44.0		0.00	
Spain	13.29	57.0		26.00	
Sweden	42.84	39.2	64.18		Chew
Sweden	42.84	39.2	52.78		Snuff
Switzerland	105.32	25.0		5.00	Snuff & chew
Ukraine	11.45	20.8	2.51		Snuff & chew
United Kingdom	185.45	24.0	137.35		Chew
United States	114.00	0.0	1.11		Chew
United States	114.00	0.0	3.32		Snuff

Abbreviation: kg = kilogram.

Note: Compares cigarette and smokeless tobacco tax rates in all countries where a smokeless tobacco tax rate was available.

Source: Compiled and calculated by the authors from multiple sources.

Tax Revenue

Tax administration of ST products in a modern market is relatively efficient at raising revenue, as taxes are collected on most products, but much less revenue is raised on smokeless tobacco than on cigarettes, due to lower consumption and lower tax rates. The largest share of ST tax in total tobacco excise tax revenue is in Sweden, but even there it reaches only 12.8%.⁴⁷ In the United States, the federal ST excise tax revenue amounted to \$165.5 million in 2010, or about 1% of the amount of federal excise tax revenue collected on cigarettes (based upon authors' calculations using the following sources: Ekonomistyrningsverket 2011,⁴⁷ Alcohol and Tobacco Tax and Trade Bureau 2012,⁴⁸ U.S. Department of the Treasury 2011⁴⁹). Nevertheless, ST tax revenue in the United States is important, as it has been used to help fund the nationwide Children's Health Insurance Program.⁵⁰ In addition to the federal excise tax, each U.S. state (except Pennsylvania) also imposes a state-level excise tax on ST products.⁵¹

Price

The tobacco industry created tiered pricing schema in both the ST and the cigarette markets. In modern markets, premium-priced ST brands occupy a much larger market share than value-priced brands.⁵²

Table 5-6 compares prices of major ST product categories with the price of the premium cigarette brand, Marlboro. Generally, ST products are less expensive than cigarettes, but the price differences between ST products and cigarettes are country-specific. It is important to note that many of the ST prices come from WHO FCTC Party reports, which do not require use of standardized methods of data collection and reporting.⁵³

Table 5-6. Price in U.S. dollars of Marlboro cigarettes (per stick) and smokeless tobacco products (per gram) in the modern market in 2011

Country	Marlboro cigarettes	Moist snuff—portion	Moist snuff—loose	Dry snuff	Chew	Source*
Canada	0.53	1.65	0.45	—	0.96	Economist Intelligence Unit 2011 (114); Euromonitor (Canada) 2010 (17)
Denmark	0.35	—	0.09	—	0.78	Economist Intelligence Unit 2011 (114); Euromonitor (Denmark) 2011 (115)
Germany	0.34	—	—	0.59	0.30	Economist Intelligence Unit 2011 (114); Euromonitor (Germany) 2010 (116)
Mexico	0.09	—	0.29	—	—	Economist Intelligence Unit 2011 (114); Euromonitor (Mexico) 2011 (117)
Norway	0.71	0.47	0.26	0.63	1.06	Lindbak & Wilson 2010 (45); Economist Intelligence Unit 2011 (114)
Sweden	0.39	0.16	0.21	—	—	Euromonitor (Sweden) 2011 (21); Economist Intelligence Unit 2011 (114)
United States	0.32	0.18	0.18	0.40	0.07	Euromonitor 2010 (2); Economist Intelligence Unit 2011 (114)

*Numbers in parentheses correspond to full citations in the References at the end of this chapter.

Sensitivity of Smokeless Tobacco Demand

Data on the price and income sensitivity of ST demand are limited compared to that for cigarettes, and the vast majority of studies have used data from the United States. Research shows that the demand for ST, like the demand for cigarettes, responds to price and income changes.⁵⁴ Economists measure the degree of responsiveness to price and income changes by calculating price, tax, and income elasticities. Various studies have estimated changes in ST demand (measured by changes in expenditures on ST or by the prevalence of ST use) in response to changes in ST prices (own-price elasticity), ST taxes (own-tax elasticity), prices/taxes of other tobacco products (cross-price/cross-tax price elasticity), and income (income elasticity of ST demand). The magnitude of price elasticity will be greater than that of tax elasticity because taxes represent only a fraction of total price. For example, in order to achieve a 10% increase in price and a corresponding decline in demand, taxes must increase by substantially more than 10%, yielding a lower estimate of tax elasticity than price elasticity.

Price Elasticity – The proportional change in quantity consumed is larger than the proportional change in price. Absolute value of price elasticity is greater than 1.

Price Inelasticity – The proportional change in quantity consumed is smaller than the proportional change in price. Absolute value of price elasticity is less than 1.

Total Price Elasticity of Demand – A measurement of consumer price responsiveness; the change in quantity demanded or purchased in response to a change in price.

Price Elasticity of Prevalence – A change in the percentage of people using a product in response to a change in price (captures the number of those who quit or do not initiate use).

Price Elasticity of Conditional Demand – A change in the amount of product being used by those who continue to use after a price change (captures lower intensity or frequency of use).

Price/Tax Elasticity – The sensitivity of consumers to price/tax changes; for example, an own-price elasticity of -0.4 means that consumption of a good will decline by 4% if the price increases by 10%.

Cross-Price/Tax Elasticity – The sensitivity of consumers to price/tax changes of a related good (e.g., cigarettes, other smokeless tobacco products); for example, a 0.8 cross-price elasticity between cigarettes and ST means that a 10% increase in the price of cigarettes will yield an 8% increase in consumption of ST.

Price Elasticity of Prevalence + Price Elasticity of Conditional Demand = Total Price Elasticity of Demand

Most studies evaluate the impact of price and income on all ST products combined and do not distinguish between various ST types. The analytic methods used to study the ST market are similar to those applied to the cigarette market.⁵⁵ Estimates from these studies are summarized in Table 5-7.

Table 5-7. Studies of price and tax elasticity estimates of smokeless tobacco demand in the modern market

Country	Elasticity	Elasticity type	Dependent variable	Primary independent variable			Source*
				Primary independent variable	Participants	Year(s)	
United States	0.02†	Cross-price	Per capita cigarette consumption	ST tax, cigarette price		2004	Goel 2008 (58)
United States	-0.715‡	Cross-price	Participation in use of any smokeless product	ST tax, real cigarette price	High school males	1995-01	Tauras et al. 2007 (72)
United States	-0.413‡	Cross-price	Frequency of use of any smokeless product	ST tax, real cigarette price	High school males	1995-01	Tauras et al. 2007 (72)
Sweden	-1.58‡	Cross-price	Aggregate Swedish snus consumption	Real cigarette price, real snus price		1964-97	Bask & Melkersson 2003 (57)
United States	0.10	Cross-tax	Participation in use of any smokeless product	Cigarette tax, ST tax	Males ≥16 years	1985	Ohsfeldt et al. 1997 (59)
United States	0.98	Cross-tax	Participation in use of snuff	Cigarette tax, snuff tax	Males ≥16 years	1992-93	Ohsfeldt & Boyle 1999 (60)
United States	0.001†	Cross-tax	Participation in use of cigarettes	Snuff tax, cigarette tax	Males ≥16 years	1992-93	Ohsfeldt & Boyle 1999 (60)
United States	0.44	Cross-tax	Participation in use of any smokeless product	Cigarette tax, smokeless tax	Males ≥16 years	1985	Ohsfeldt & Boyle 1994 (73)
United States	-0.052	Own-tax	Participation in use of any smokeless product	Real snus price	Adolescent males	1992-94	Chaloupka et al. 1996 (71)
United States	-0.032	Own-tax	Frequency of use of any smokeless product	Real snus price	Adolescent males	1992-94	Chaloupka et al. 1996 (71)
United States	-0.402	Own-price	Participation in use of any smokeless product	Real snus price	Adolescent males	1992-94	Chaloupka et al. 1996 (71)
United States	-0.248	Own-price	Frequency of use of any smokeless product	Real snus price	Adolescent males	1992-94	Chaloupka et al. 1996 (71)

Country	Elasticity	Elasticity type	Primary independent variable				Source*
			Dependent variable	Participants	Year(s)	Source*	
Sweden	0.94	Own-price	Aggregate Swedish snus consumption	Real snus price	1964–97	Bask & Melkerisson 2003 (57)	
United States	-0.01	Own-tax	Participation in use of snuff	Snuff tax	1992–93	Ohsfeldt & Boyle 1999 (60)	
United States	-0.159	Own-tax	Participation in use of any smokeless product	ST tax	1995–01	Tauras et al. 2007 (72)	
United States	-0.065	Own-tax	Frequency of use of any smokeless product	ST tax	1995–01	Tauras et al. 2007 (72)	
United States	-0.15	Own-tax	Participation in use of any smokeless product	ST tax	1985	Ohsfeldt et al. 1997 (59)	
United States	-0.55	Own-tax	Participation in use of any smokeless product	ST tax	1985	Ohsfeldt & Boyle 1994 (73)	

*Numbers in parentheses correspond to full citations in the References at the end of this chapter.

†Not statistically significant.

‡Complements.

Abbreviation: ST = smokeless tobacco.

Generally, estimates of own-price elasticities of ST demand range between -0.25 and -0.5 , similar to those for cigarettes.⁴¹ This means that ST is price-inelastic because the absolute value of its price elasticity is smaller than 1. Estimates of cross-price elasticity measure the degree to which ST products are substitutes for or complements to other tobacco products, primarily cigarettes. There is strong evidence that higher taxes on cigarettes lead to an increase in the use of ST products, especially when the relative prices of ST and cigarettes are changing (i.e., when the prices of the two products have evolved at different speeds).⁵⁵ Despite this evidence that these products are substitutes, there is concern that tobacco company marketing efforts promoting dual use of ST and cigarettes may fundamentally change this relationship to a complementary one. The impact of higher ST taxes on cigarette use is less clear.⁵⁶⁻⁶⁰ Observations from Finland have linked the country's 1995 ban of snus from the market to an 11% increase in cigarette consumption by 2001.⁶¹

Complementary products – Products that are consumed together, wherein increased consumption of one product increases consumption of the other (e.g., automobiles and gas).

Substitute products – Products that are consumed in an either/or fashion, wherein increased consumption of one product decreases consumption of the other (e.g., margarine and butter).

Demand for ST is also affected by income. Studies have tried to determine if ST is a normal good or an inferior good. The evidence from the modern marketplace suggests that ST is an inferior good, meaning that its consumption will decrease as the income of consumers rises (Table 5-8). However, the evidence that ST is an inferior good comes from the United States during the period of 1985 to 1994, which limits the generalizability of the findings to other places and periods of time.^{59,60}

Normal Good – A good that is consumed in larger quantities as a consumer's income increases.

Inferior Good – A good that is consumed less as a consumer's income increases.

Table 5-8. Income elasticity of smokeless tobacco demand in the modern market (United States)

Income elasticity	Type of good	Dependent variable	Year	Source*
(-0.0068† to -0.0069†)	Inferior	Participation in use of snuff‡	1993	Ohsfeldt & Boyle 1999 (60)
(-0.0001 to -0.0009†)	Inferior	Participation in use of snuff§	1993	Ohsfeldt & Boyle 1999 (60)
0.004	—	Participation in use of any smokeless product	1992–1994	Chaloupka et al. 1996 (71)
0.004	—	Frequency of use of any smokeless product (ordinal dependent variable)	1992–1994	Chaloupka et al. 1996 (71)
0.003	—	Frequency of use of any smokeless product (continuous dependent variable)	1992–1994	Chaloupka et al. 1996 (71)
(-0.0015‡)	Inferior	Participation in use of snuff	1985	Ohsfeldt et al. 1997 (59)
(-0.0021‡)	Inferior	Participation in use of chew	1985	Ohsfeldt et al. 1997 (59)
(-0.0019‡)	Inferior	Participation in use of any smokeless product	1985	Ohsfeldt et al. 1997 (59)

*Numbers in parentheses correspond to full citations in the References at the end of this chapter.

†Statistically significant ($p < 0.01$).

‡Model controls for tobacco control policies by an index.

§Model controls for individual tobacco control policies.

Note: Income inelasticity measures the sensitivity of consumers to income changes. For example, -0.007 income elasticity means that the consumption of the good is going to decline by 0.007% if the income increases by 1%. An income elasticity value of 0.5 means that consumption of a good will increase by 5% if a consumer's income increases by 10%.

Traditional Markets

Geography and Characteristics

Traditional markets can be found primarily in South and Central Asia (Afghanistan, Bangladesh, Bhutan, India, Kyrgyzstan, Kazakhstan, Maldives, Nepal, Pakistan, Sri Lanka, Tajikistan, Turkmenistan, and Uzbekistan), Sub-Saharan Africa, the Western Pacific, and Latin America. The volume of ST products sold in these markets is much larger than in modern markets, as the vast majority of the world's ST users live in traditional market countries (chapter 2). Traditional markets are competitive markets characterized by a high degree of product diversity, a lack of product standardization, low levels of market concentration, low barriers to product entry into the market, lack of mass commercialization, and the absence of multinational tobacco corporations. These markets are organized primarily as cottage industries, with informal production, distribution, and retail chains. Because of these characteristics, economic analyses of traditional ST markets are much more challenging compared to modern markets.

Most of the data and research evidence on traditional ST markets come from India, the world's largest ST market.⁶² However, researchers in this area struggle with severe data limitations because little is known about prevalence, intensity of use, product prices and taxes, product characteristics, distribution channels, labor practices, and tax collection.

Price, Tax, and Tax Revenue

Information on ST prices in traditional markets is scarce. Smokeless tobacco price data (Table 5-9) were obtained from WHO FCTC Party reports and Euromonitor International country reports. Because the methods used to calculate these prices are not known, prices should not be compared across products or countries.

Table 5-9. Smokeless tobacco prices in the traditional market

Country	Product	US\$/gram	Year	Source*
Algeria	Chemma	0.014	2010	Youcef 2011 (118)
Bangladesh	Hakimpuri Zarda	0.017	2009	Senior Assistant Secretary 2010 (119)
Bangladesh	Suravi	0.006	2009	Senior Assistant Secretary 2010 (119)
Congo, Democratic Republic of	Chew	0.15/scoop	2008	Muteba 2009 (120)
Djibouti	Angadda/Bouri	0.011	2009	Ali-Higo & Djibouti 2009 (121)
Djibouti	Kourkoura	0.017	2009	Ali-Higo & Djibouti 2009 (121)
India	Rajnigandha Pan Masala	0.086	2008	Euromonitor 2010 (2)
India	Sathi Khaini	0.006	2008	Euromonitor 2010 (2)
India	Unbranded khaini	0.001	2008	Euromonitor 2010 (2)
India	RMD Gutkha Mini	0.046	2008	Euromonitor 2010 (2)
Lesotho	Babaton	0.373	2010	Mosala 2010 (122)
Marshall Islands	Copenhagen	0.146	2005	Edwards & Langdrik 2010 (123)
Panama	Masticable Picadora Wolf	0.020	2010	Roa 2010 (124)
Peru	Longhorn Snuff	0.312	2010	Euromonitor 2010 (125)
Peru	Lotzbeck Snuff	0.347	2010	Euromonitor 2010 (125)
South Africa	Taxi Snuff	0.036	2010	Moodley and Phaka 2010 (126)
Swaziland	Snuff	0.043	2009	Dlamini 2009 (127)
Tunisia	Neffa	0.005	2010	Euromonitor (Tunisia) 2011 (128)

*Numbers in parentheses correspond to full citations in the References at the end of this chapter.

Traditional market excise tax structures for ST are very similar to those in modern markets. Just as in modern markets, the excise tax accounts for a smaller share of the retail price of ST products compared to cigarettes. For example, the excise tax on cigarettes in Algeria represents 40% of the retail price, whereas the excise tax on ST products reaches about 35% of retail prices.^{3,43,63}

Table 5-10 summarizes excise tax rates on ST products levied in various countries. The main difference between the traditional and modern markets is the efficiency and effectiveness of tax collection.

Table 5-10. Smokeless tobacco tax rates in traditional market countries (per year)

Country	Specific excise (US\$/weight)	Ad valorem tax (%)	Type of product	Year	Source*
Algeria	9.86/kg		Snuff & chew	2011	Direction Generale des Impots (Algeria) 2011 (63); TMA 2011 (46)
Argentina		20.0	Snuff	2009	Fernandez 2009 (129); Ministerio de Economía y Producción (Argentina) 2011 (130)
Azerbaijan		12.5	Snuff & chew	2011	TMA 2011 (46); Ministry of Taxes, no date (131)
Bangladesh		30.0	Jarda, gul	2011	Barkat et al. 2012 (132)
Barbados	23.56/kg		Snuff	2011	TMA 2011 (46)
Benin		61.5		2011	Agossou et al. 2011 (133)
Bolivia		50.0	Snuff & chew	2011	TMA 2011 (46); Government of Bolivia 2001 (134)
Bosnia and Herzegovina	1.46/kg		Snuff & chew	2011	TMA 2011 (46)
Brazil		30.0	Snuff & chew	2011	TMA 2011 (46); Receita Federal do Brasil, no date (135)
Burkina Faso		17.0	Snuff & chew	2011	TMA 2011 (46); Théodore 2009 (136)
Burundi		41.0	Snuff & chew	2011	TMA 2011 (46)
Cambodia		10.0		2008	Pheang 2008 (137)
Cameroon		25.0		2009	Sibetchu 2008 (138)
Chile		59.7	Snuff & chew	2011	TMA 2011 (46); Servicio de Impuestos Internos (SII) (Chile) 2011 (139)
China		30.0	Snuff & chew	2011	TMA 2011 (46)
Costa Rica		60.0	Snuff & chew	2011	Sistema Costarricense 2011 (140)
Côte D'Ivoire	13.12/kg		Snuff & chew	2011	TMA 2011 (46)
Dominican Republic		65.0		2008	Direccion General de Impuestos Internales 2004 (141)
Ecuador		150.0		2008	Salazar 2008 (142); Servicio de Rentas Internas (SRI) (Ecuador) 2007 (143)
Egypt	1.35/kg			2010	Ministry of Finance (Egypt) 2008 (144)
El Salvador		39.0	Snuff & chew	2011	TMA 2011 (46); La Asamblea Legislativa de la Republica de El Salvador 2004 (145)
Ethiopia		75.0	Snuff	2011	Ethiopian Revenue & Customs 2008 (146)

Country	Specific excise (US\$/weight)	Ad valorem tax (%)	Type of product	Year	Source*
Fiji	51.36/kg		Snuff & chew	2011	TMA 2011 (46)
Gabon		30.0	Snuff & chew	2011	TMA 2011 (46); Direction Generale des Impots (Gabon) 2006 (147)
Gambia				2009	Bah 2009 (147)
Ghana		0.0	Snuff & chew	2007	Ministry of Finance and Economic Planning (Ghana) 2007 (148)
Guatemala		100.0	Snuff & chew	2011	TMA 2011 (46)
Guyana		100.0	Snuff & chew	2011	TMA 2011 (46)
India		86.0	Snuff & chew	2011	John et al. 2010 (64); TMA 2011 (46)
Indonesia		30.0	Snuff & chew	2011	TMA 2011 (46)
Iran, Islamic Republic of		5.0	Snuff & chew	2011	TMA 2011 (46)
Jamaica		14.5	Snuff & chew	2011	TMA 2011 (46)
Kazakhstan	8.39/kg		Snuff & chew	2011	TMA 2011 (46)
Kenya		130.0	Snuff & chew	2011	TMA 2011 (46); Kenya Revenue Authority 2010 (149)
Korea, Republic of	15.08/kg		Snuff	2011	TMA 2011 (46)
Korea, Republic of	24.09/kg		Chew	2011	TMA 2011 (46)
Kuwait		0.0	Snuff & chew	2011	TMA 2011 (46)
Kyrgyzstan	0.03/kg		All	2008	Decree of the President 2006 (150)
Lebanon		108.0	Snuff & chew	2011	TMA 2011 (46)
Madagascar	0.0032/sachet	20.0	Chew	2011	TMA 2011 (46); Ministère des Finances 2010 (151)
Madagascar	0.0005/sachet	50.0	Snuff	2011	TMA 2011 (46); Ministère des Finances 2010 (151)
Malaysia	8.93/kg	5.0	Snuff & chew	2011	TMA 2011 (46); JKDM HS Explorer 2011 (152)
Mali		78.0	Snuff & chew	2011	TMA 2011 (46)
Marshall Islands	80.41/kg		Snuff	2010	Edwards & Langdrik 2010 (123)

Country	Specific excise (US\$/weight)	Ad valorem tax (%)	Type of product	Year	Source*
Mauritania		20.0	Snuff & chew	2011	TMA 2011 (46)
Mauritius		230.0	Snuff & chew	2011	TMA 2011 (46); Mauritius Revenue Authority 2004 (153)
Micronesia		50.0		2010	Skilling 2010 (154)
Morocco		59.4	Snuff & chew	2011	TMA 2011 (46)
Mozambique		75.0	Snuff & chew	2011	TMA 2011 (46)
Myanmar		60.0	Chew	2011	TMA 2011 (46)
Myanmar		25.0	Betel	2007	Kyaing 2007 (155)
Nepal	2.32/kg		Chew	2011	TMA 2011 (46)
Nicaragua		0.0	Snuff & chew	2011	TMA 2011 (46)
Niger		10.0	Snuff & chew	2011	TMA 2011 (46)
Nigeria		50.0	Snuff & chew	2011	TMA 2011 (46)
Oman		0.0	Snuff & chew	2011	TMA 2011 (46)
Pakistan		15.0	Chew	2011	Ministry of Finance (Pakistan) 2011 (156)
Panama		50.0		2009	Roa & Vergara 2010 (124); Gaceta Oficial (Panama) 2009 (157)
Papua New Guinea	20.35/kg		Snuff & chew	2011	TMA 2011 (46)
Paraguay		10.0	Snuff & chew	2011	TMA 2011 (46); Subsecretaría de Estado de Tributación, no date (158)
Peru		50.0	Snuff & chew	2011	TMA 2011 (46); Alburqueque 2007 (159)
Philippines	0.02/kg		Chew	2011	TMA 2011 (46); Thirteenth Congress of the Philippines 2004 (160)
Rwanda		0.0		2009	Nzeyimana 2009 (161)
Saint Lucia		10.0	Snuff & chew	2011	TMA 2011 (46)
Saudi Arabia		0.0	Snuff & chew	2011	TMA 2011 (46)
Senegal		40.0	Snuff & chew	2011	TMA 2011 (46); Direction Général des Impôts et des Domaines (Senegal) 2011 (162)

Country	Specific excise (US\$/weight)	Ad valorem tax (%)	Type of product	Year	Source*
Singapore	280.48/kg		Snuff	2011	TMA 2011 (46); Ministry of Finance (Singapore) 2011 (163)
Singapore	157.89/kg		Chew	2011	Ministry of Finance (Singapore) 2011 (163)
South Africa		0.0	Snuff	2011	TMA 2011 (46); South African Revenue Service 2012 (164)
Sri Lanka		0.0		2011	Sri Lanka Customs 2011 (165)
Swaziland	21.93/kg		Snuff	2009	Dlamini 2009 (127); Swaziland Revenue Authority 2010 (166)
Syria		15.0	Chew	2011	TMA 2011 (46); Syrian Ministry of Finance 2004 (167)
Tajikistan		10.0	Snuff & chew	2011	TMA 2011 (46)
Thailand	2.73/kg	0.1	Chew	2008	Kingdom of Thailand 2010 (168); Termsirikulchai et al. 2008 (169)
Tonga	75.10/kg			2009	Vivili 2009 (170)
Trinidad and Tobago			All	2010	Ministry of Health 2010 (171)
Tunisia		135.0	Snuff & chew	2011	TMA 2011 (46); Ministère des Finances (Tunisia) 2010 (172)
Turkey		63.0	Snuff	2010	Altan & Irmak 2011 (173); Council of Ministers (Turkey) 2011 (174)
Turkmenistan	10.00/kg		Snuff & chew	2011	TMA 2011 (46)
Uganda		150.0	All	2009	Uganda Revenue Authority 2009 (175); TMA 2011 (46)
Venezuela		70.0	Snuff & chew	2011	TMA 2011 (46)
Vietnam		65.0		2011	Ministry of Finance (Vietnam) 2011 (176)
Yemen		90.0	Snuff & chew	2011	Customs Authority (Yemen) 2010 (177); TMA 2011 (46)
Zambia	24.36/kg		Snuff & chew	2008	Zambia Revenue Authority 2008 (178)

*Numbers in parentheses correspond to full citations in the References at the end of this chapter.
Abbreviations: kg = kilogram; TMA = Tobacco Merchants Association.

The scarcity of data on tax evasion and avoidance makes it extremely difficult to determine the effective tax rate in traditional markets. We know very little about the market penetration of custom-made, cottage-industry, or illicit ST products. However, it can be expected that the effectiveness of tax collection for less prominent ST products is worse than for more prominent products like cigarettes.⁴¹

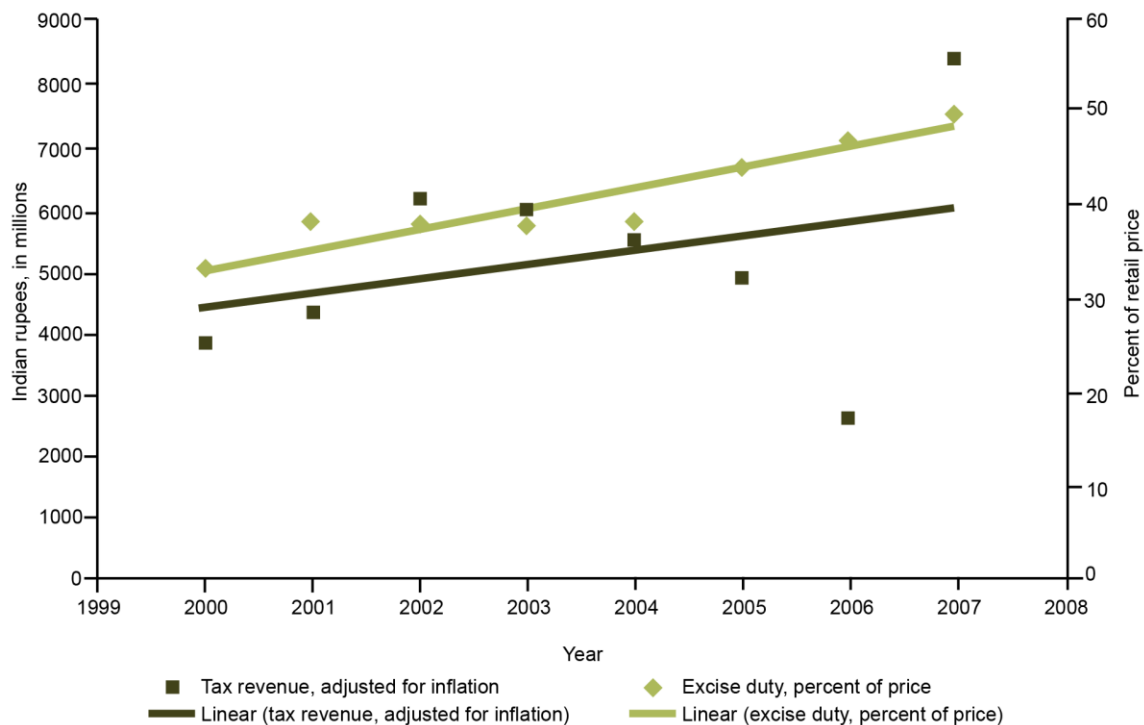
Despite these challenges, some ST taxes in traditional markets are collected and can contribute significantly to a government's revenue. Table 5-11 shows that ST taxes in India contributed between 3.84% and 11.98% of the total tobacco excise tax revenue from 1999 to 2007. During this time, the ST tax rate increased from 33% to 50% of the retail price (Figure 5-3). This tax rate increase, combined with population growth, resulted in higher ST tax revenue in both real and nominal terms (Figure 5-3 and Table 5-12).⁶⁴

Table 5-11. Percentage contribution of various tobacco products to total tobacco excise tax revenues in India, 1999–2007

Years	Cigarettes	Bidis	Chewing tobacco	Other tobacco products
1999–2000	86.18	5.70	6.22	1.89
2000–2001	84.75	5.79	6.96	2.50
2001–2002	78.52	5.54	9.79	6.15
2002–2003	80.00	5.61	9.84	4.55
2003–2004	82.82	5.07	9.25	2.87
2004–2005	83.60	4.86	8.05	3.49
2005–2006	84.76	4.39	3.84	7.01
2006–2007	76.95	4.64	11.98	6.43

Source: Calculated by the authors based on data from John et al. 2010 (64).

Figure 5-3. Excise tax and tax revenue from chewing tobacco in India



Source: John et al. 2010 (64).

Table 5-12. Tax revenue from chewing tobacco in India, adjusted and unadjusted for inflation, 1999–2007

Year	U.S. dollars in millions		Indian rupees in millions	
	Adjusted	Unadjusted	Adjusted	Unadjusted
1999–2000	83.734	78.141	3,763.2	3,511.8
2000–2001	90.228	90.228	4,257.5	4,257.5
2001–2002	125.242	129.747	6,088.0	6,307.0
2002–2003	126.641	135.670	5,899.3	6,319.9
2003–2004	119.838	135.385	5,430.6	6,135.1
2004–2005	108.819	130.905	4,798.9	5,772.9
2005–2006	56.681	71.170	2,568.1	3,224.5
2006–2007	201.589	266.843	8,335.5	11,033.7

Source: John et al. 2010 (64).

The volume of ST tax revenue collected by the Indian government contrasts with the ST tax revenue collected in Bangladesh, the second-largest ST market based on the number of ST users, where ST tax revenue represents only 0.4% of the total tobacco tax revenue.⁶⁵

Sensitivity of Smokeless Tobacco Demand

Data on the responsiveness of ST demand to changes in price and income in traditional markets are even more limited than in modern markets. There are gaps in consumption and price data, and the absence of standard packaging makes it difficult to calculate unit prices. Some evidence indicates that ST users in traditional markets are price-sensitive and that higher prices on ST would lead to lower consumption.^{66,67} No existing research appears to clarify the relationship between income and ST use in traditional markets.

The price elasticity of tobacco leaf demand in India has been estimated at -0.883 , meaning that for every 10% increase in tobacco leaf prices, the consumption of tobacco leaf will decrease by 8.83%.^{64,68} This suggests that, as higher prices for the raw tobacco used in ST products are passed on to consumers in the form of higher retail prices, overall tobacco use will be reduced, and most likely ST use as well. Another study from India used micro-level data to estimate that a 10% increase in the price of gutka would decrease consumption by 5.8% and prevalence of gutka use by 2.7%.⁶⁹

One study used macro-level data to calculate the cross-tax elasticity between cigarettes and betel quid without tobacco (a product that can serve as a proxy for ST use because it is consumed in a similar way) and the own-price elasticity of the demand for betel nuts in Taiwan.⁷⁰ The cross-price elasticity between cigarettes and betel nuts ranged from -0.082 to -0.131 , suggesting that these two products are complements.⁷⁰ This could be similar to the relationship between ST consumption and cigarette prices found in some studies using modern market data.⁷² The own-price elasticity of betel use was -0.384 , which was lower than the own-price elasticity of cigarette demand (-0.609 to -0.824) calculated in the same study,⁷⁰ but comparable to estimates from ST studies in modern markets.^{59,60,71-73}

Economic theory predicts that ST products would be more price-elastic in traditional markets than in modern markets because many consumers can easily substitute custom-made tobacco products for manufactured ST products. However, more research is needed to support or reject this hypothesis.

Since about 2001, the economies of traditional markets have grown more rapidly than economies of modern markets, which has increased the affordability of all products, including ST products. In India, for example, chewing tobacco became much more affordable from 2001 to 2007 despite the higher ST tax and price increases, because these increases were not sufficient to offset the level of inflation and income growth (Table 5-13). Greater affordability may explain the growing consumption of chewing tobacco in India.⁶⁴

Table 5-13. Chewing tobacco affordability in India, 2001–2007

Year	Affordability
2001	0.64
2002	0.58
2003	0.63
2004	0.56
2005	0.51
2006	0.49
2007	0.48

Note: The affordability of smokeless tobacco is measured as the percentage of per capita gross domestic product required to buy 100 packs of chewing tobacco. The higher value indicates less affordability.

Source: John et al. 2010 (64).

Gaps and Limitations

Very few data exist on ST prices, tax rates, and tax structures, which makes research into the impact of ST taxes and ST prices on ST use very difficult, if not impossible. Very little is known about the extent to which higher ST taxes translate into higher ST prices and how these prices affect the affordability of ST products. The affordability of ST should be studied in conjunction with the affordability of smoked tobacco (cigarettes) to determine how the population responds to changes in the relative prices of these two types of tobacco products.

Establishing a standardized unit of consumption and gaining a better understanding of the ST market structure will also be important for future studies on the price and income elasticities of ST demand. These future studies can help determine whether ST products are used as substitutes for or in combination with smoked tobacco, and if this relationship changes over time or according to pricing structure. Such findings will inform the development of public policies to control both smoked and ST use.

Summary and Conclusions

The tax system that best suits public health goals is likely to be country-specific. As a general rule, an excise tax system that effectively raises the prices of ST products and makes them less affordable over time is ideal because it would discourage consumption. Countries experiencing rapid economic growth may need to increase their ST taxes at a pace that ensures that prices for ST products increase faster than inflation and income growth. Another option would be to equalize tax at high rates across all tobacco products to limit substitution.

Best practice for cigarette taxation favors the use of a specific tax that is regularly adjusted for inflation because it reduces the price gap between the less expensive (most affordable) and more expensive products.⁴¹ In some cases, a mixed excise tax system that contains both ad valorem and specific components can most efficiently deal with the tobacco industry's efforts to avoid taxes by manipulating the tobacco content of ST products. For example, reducing the content of tobacco in a product reduces

the tax burden if the specific excise tax depends on the tobacco weight of a product. On the other hand, lowering the declared value of a product reduces its tax burden if the tax is levied ad valorem. More studies are needed to clarify both the relationship between ST and smoked tobacco products, and how consumers respond to relative and absolute price changes of these products. Answers to these questions will have implications for the design of an efficient tobacco tax regime.

Smokeless tobacco tax revenue is expected to increase with higher ST tax rates because the demand for ST is price-inelastic. However, this revenue increase depends on the efficiency of a country's tax collection system. System improvements, such as switching from taxing producers based on production volume to taxing based on production capacity, can theoretically increase the efficiency of collecting taxes. (India levies tobacco excise taxes based on the production capacity of a facility, rather than the declared production volume generated by a facility. The production capacity is always greater than or equal to the production volume.)

The effectiveness of tax collection systems and the impact of higher taxes on ST use will also depend on the standardization of ST products.⁷⁴ Lack of standardization complicates not only tax collection but also scientific research, as it hinders the use of econometric methods.

A standard unit can be based on a dose, the weight of tobacco, or the weight of a product. The weight of a product includes its water content and the weight of any additives, which is especially important in smokeless tobacco. The weight of tobacco refers to the weight of dry leaf in the product, which will be smaller than the total weight of the product. These varying definitions of a standard unit have advantages and disadvantages. A dose is equal to the average amount of a product used in a single session, but not all products are sold in pre-portioned single servings. In addition, different ST products are used for different lengths of time. For example, a Camel Orb (a dissolvable tobacco product) dissolves in the mouth in under 20 minutes, whereas a betel quid can stay in a user's mouth for over 12 hours. Using the weight of tobacco as a standard measurement focuses on the primary concern of tobacco use. However, the tobacco content in an ST product would have to be determined or reported by ST manufacturers. For this reason, using the weight of an ST product as a base for calculating taxes would be easier than using the weight of tobacco in a product. Although information on total product weight is usually readily available in countries that have specific excise tax regimes, this standard would tax products with higher tobacco density (e.g., dry snuff) less than products with lower tobacco density per unit of weight (e.g., moist snuff). This discrepancy in taxation rates can be leveled by setting different tax rates for different types of tobacco products. Standardization methods can also be combined. For example, tax liability can be assessed based on the weight of the ST product, and a minimum tax amount can be set per dose.

Because the multinational tobacco corporations have recognized ST as the next frontier in expanding their business,³⁸ tobacco control research must adjust its resources in anticipation of the increased demand for these products.

Implementation of an appropriate surveillance system will be required to better understand the ST marketplace and the economic incentives linked to ST use. Systematic data collection on both the prevalence and the intensity of ST use by ST product type is necessary to assess the size of the ST marketplace, the level of substitution between various ST products and substitution with smoked

tobacco, and the introduction and uptake of novel ST products. To evaluate the opportunity costs associated with ST use, personal and/or household expenditures on ST products must also be tracked.

Data on ST prices, taxes, ST tax revenue, and ST trade (including illicit) are needed. This information could be collected by changing WHO FCTC reporting to require collection of data on all tobacco products, not just cigarettes. Designing an effective ST tax regime will require monitoring and regulation of the ST supply chain (i.e., manufacturing, trade, and distribution). Taxing tobacco leaves could help control the use of ST in the diverse and multilayered traditional markets.

In conclusion, the development of recommendations for the most appropriate ST tax structures must take into account the type of ST product and the tax structure applied to other tobacco products sold in a particular market. A WHO study group recommended that several economic and tax-related guidelines be followed in the formulation of ST control policy.⁷⁵ Namely, the study group recommended that (1) ST be taxed “at a level sufficient to act as a disincentive, and at least at the level at which cigarettes are taxed,”^{75,p.64} (2) taxes should increase in real terms over time, and (3) a portion of ST tax revenue should be earmarked to support health promotion efforts.⁷⁵ Recent (2010) guidelines for tobacco taxation stipulate that equal tax rates should be imposed on all tobacco products.⁴¹ The WHO technical manual recommends that the excise tax on cigarettes (either specific or ad valorem) make up at least 70% of the retail price, and it favors the use of the specific excise tax because of its administrative simplicity and effectiveness in reducing tobacco use. Smokeless tobacco products should meet an equivalent standard to shift discussions of smokeless tobacco and cigarette tax structures in the direction of tobacco tax structures.⁴¹ This cohesive approach to tobacco control policy can produce more consistent, comprehensive, and effective tobacco control legislation over time.

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