Tobacco Taxation and Its Potential Impact in China

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"An increase in the specific excise tax of RMB 1 on a pack of cigarettes would increase government revenue by RMB 64.9 billion (US$ 7.9 billion), save 3.4 million lives, reduce medical costs by RMB 2.68 billion (US$ 325 million) and generate a productivity gain of RMB 9.92 billion (US$ 1.2 billion) for the Chinese economy."

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Protect people from tobacco smoke

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Raise taxes on tobacco

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Executive Summary

The objective of this paper is to provide evidence-based policy analysis on the use of taxation as a key tobacco control instrument in China.

Health and Economic Consequences of Smoking

China has the world's highest number of smoking-attributable deaths: one million premature deaths annually, a number that will reach two million by 2020 unless effective tobacco control programs are implemented.

The costs of smoking to Chinese society were estimated at RMB 41 billion (US$ 5.0 billion): RMB 14 billion (US$ 1.7 billion) in medical treatment costs and RMB 27 billion (US$ 3.3 billion) in lost productivity (based on values given for the year 2000). The treatment costs of smoking accounted for 3.1 percent of China's national health expenditures in 2000.

Smoking has negative impacts on household expenditure patterns as well. Households with smokers spent less on food, education, clothing, and housing than households of nonsmokers. Poor households in China spent 8 to 11 percent of total household expenditures on cigarettes. Medical spending related to the negative health consequences of smoking impoverished 30.5 million urban residents and 23.7 million rural residents in China in 1998.

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The Role of the Cigarette Industry and Tobacco Farming

In 2005, China's state-owned tobacco monopoly company produced 1.7 trillion cigarettes, generating a tax and profit of RMB 240 billion (US$ 30 billion), about 7.6 percent of the central government's total revenue. (The proportion of tobacco tax and profit revenue to the government's total revenue has been declining since 1995.) The tobacco industry employed about a half million people, 0.06 percent of total employment in all sectors.

The special tobacco leaf tax (20 percent of the procuring price), a form of local tax revenue, is a pervasive incentive for local authorities to increase the production of tobacco leaf, resulting in an oversupply of tobacco leaf as well as a lower tobacco leaf price. Production of tobacco leaf had a lower net return than fruit, vegetable oil, beans, and mulberries, due in part to the oversupply of tobacco leaf in the market generated by the quotas assigned to farmers through the tobacco leaf tax.

The Relationship Between Taxation, Government Revenue, and Health

Taking into account both inflation and purchasing power, cigarettes have become more than twice as affordable in China since 1990. Smoking in China is much less costly than in Indonesia and Thailand, for example.

The overall effective tax rate of 40 percent measured at the retail price level in China is much lower than the international community's median tax rate, which ranges between 65 and 70 percent. Given

Given the current minimum amount of specific excise tax on cigarettes, the tax reform most likely to be effective for tobacco control in China is to increase the specific excise tax.

the negative health and economic consequences of smoking, there is much room to raise the tobacco tax for the purpose of tobacco control in China.

To determine the impact of taxation on smoking prevalence and the effect on government revenue, population health, and the tobacco economy, the price of cigarette consumption (price elasticity) is the key parameter. This study used price elasticities of demand of −0.15 and −0.50 to simulate the impact of tax increases on government revenue, population health, and the economy with an increase in the specific excise tax of RMB 1 per pack up to an additional RMB 4 per pack. Given the current minimum amount of specific excise tax on cigarettes, the tax reform most likely to be effective for tobacco control in China is to increase the specific excise tax. Simulation estimations focus on the specific excise tax alone while maintaining the current *ad valorem* tax structure. Owing to a lack of detailed micro-consumption data by income and price, simulation of the impact of possible changes in the *ad valorem* tax rate is not provided.

An increase in the specific excise tax of RMB 1 on a pack of cigarettes, with a price elasticity of −0.50 (smoking participation elasticity at −0.20), would increase government revenue by RMB 64.9 billion (US$ 7.9 billion), save 3.42 million lives, reduce medical costs by RMB 2.68 billion (US$ 325 million), and generate a productivity gain of RMB 9.92 billion (US$ 1.2 billion) for the Chinese economy.

Policy Recommendations

To achieve tobacco control in China will require far-reaching measures. These recommendations are offered in that spirit.

- **Increase the cigarette tax**

  The Chinese government should consider increasing the specific excise tax by RMB 1 per pack (or RMB 2,500 per case) in the short term and up to RMB 4 per pack in the longer term. (This increase should be adjusted automatically for inflation.)

  If the Chinese government maintains the *ad valorem* tax as a part of the tobacco tax system, China should consider working toward a uniform tax rate across brands. An overall cigarette tax rate of at least 65 percent to 70 percent of the consumers' purchase price in line with the median range of international tax rates, is needed to achieve the goal of tobacco control.

- **Remove the tobacco leaf tax**

  The Chinese government should consider removing the special tobacco leaf tax.

  The China National Tobacco Company (CNTC) is the only legitimate buyer of tobacco leaf. As a purchaser, CNTC withholds 20 percent of its purchase price as the tobacco leaf tax and submits the amount to the local government as local government tax revenue. Whereas the Chinese central government considers the imposition of tobacco leaf tax one way to control tobacco supply and provide financial assistance to the local government, in actuality the tobacco leaf tax acts as an incentive to encourage village and township officials to plant tobacco leaf above and beyond the CNTC quota. Therefore, farmers need to sell their

leftover leaf to underground private cigarette companies either for private local brands or for counterfeit brands.

- **Reform revenue sharing between the central and local government**

  The current cigarette tax revenue-sharing mechanism that exists between the central and local government encourages local governments to over-produce, resulting in inefficient resource allocation in tobacco production. It might be more effective and fiscally more efficient to consider the tobacco tax as central government revenue. Instead of sharing revenue with the local government, the central government would collect and keep the entire tobacco tax revenue and let the Ministry of Finance and other central government agencies address revenue allocation to local government.

- **Earmark the additional tax revenue**

  The Chinese government should consider allocating some of the additional cigarette tax revenue to subsidize tobacco farmers for crop substitution and to the cigarette industry for retraining displaced employees. In addition, the government should provide health insurance coverage for low-income populations and conduct tobacco control activities. The combined effect of price and non-price tobacco control regulations will maximize the effect of tobacco control programs in China.

I. Introduction

Prevalence of Smoking and Health Consequences

China is the largest producer and consumer of tobacco in the world. It grows one third (2.435 million tons of tobacco leaf) of the world's tobacco crop and produces and consumes one third (1.7 trillion cigarettes) of the world's cigarettes. In 2006, China's Ministry of Health prepared a report titled *China Smoking and Health Report 2006*. The report cited the 2002 National Smoking Prevalence Survey, which estimated 350 million ever smokers in China — 35.8 percent of China's population over age 15 (66 percent of men and 3.1 percent of women). Current smokers numbered 300 million — 57 percent of men and 2.6 percent of women. The report pointed out that smoking prevalence for persons 15 to 24 years old had risen, and the average age of smoking initiation had decreased from 22.4 in the 1980s to 19.7 in 2002.[1]

The health and economic consequences of smoking are alarming, especially given China's high smoking prevalence rate. China has the world's highest number of smoking-attributable deaths: one million deaths annually.[2] This figure represents one in four such deaths throughout the world. Smoking-attributable deaths in China are projected to rise to 2 million by the year 2020.[3] To put tobacco smoking into context with other major health risk factors, the number of lives lost from tobacco smoking in China is almost 3 times the number caused by air pollution, 2.4 times the number caused by unsafe water, 5 times the number caused by tuberculosis, and 30 times the number caused by HIV/AIDS.[4]

The health consequences of smoking can be measured in Disability Adjusted Life Years (DALYs).[5] According to the 2002 WHO (World Health Organization) World Health Report, tobacco smoking was responsible for about 10 million DALYs in China and ranked third in leading risk factors after high blood pressure and alcohol use.[6] The effects of secondhand smoking, including lung cancer and ischemic heart disease, also were estimated by the DALY method. In 2002, close to half a million additional DALYs were lost in China due to secondhand smoking — around 5 percent of the burden of the same diseases caused by active smoking.[7]

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Economic Cost of Smoking

The health burdens of smoking also can be measured in terms of monetary cost, which includes both medical treatment costs (direct costs) and loss of productivity (indirect costs) from morbidity and mortality. A study that used the 1998 China National Health Services Survey estimated the total smoking-attributable total costs of three major diseases — cancer, cardiovascular disease, and respiratory disease — at RMB 41.0 billion (or US$ 5.0 billion, US$ 1 = RMB 8.20 at the 2000 exchange rate) measured in 2000 value, about RMB 208 (US$ 25.43) per smoker (≥ age 35).[8] The share of the economic costs was greater for men than for women and greater in rural areas than in urban areas. Of the RMB 41.0 billion (US$ 5.0 billion) in total costs, direct costs were RMB 14 billion (US$ 1.7 billion), 34 percent of the total;

indirect morbidity costs were RMB 3.3 billion (US$ 0.4 billion), or 8 percent; and indirect mortality costs were RMB 23 billion (US$ 2.9 billion), or 58 percent. The direct costs of smoking accounted for 3.1 percent of China's national health expenditures in 2000. According to the Chinese national statistics, 60 percent of health care expenditures were personally paid, while 40 percent were paid by the public sector.[9]

In contrast to the survey-derived (the human capital) calculations of indirect costs given above, which provide a lower bound of the value of life, the willingness-to-pay approach (WTP) — that is, what a person would pay to reduce the risk of death — can improve the estimate of indirect costs. Four recent WTP studies in China that used the contingent valuation method provided a range of estimates for the average value of one life — from RMB 0.24 million to as high as RMB 1.7 million.[4] Three of the estimates were between RMB 0.24 and 0.3 million. A low-end estimate of RMB 0.25 million (US$ 0.03 million) is used here to estimate the indirect costs of smoking. Of the one million annual premature smoking-attributable deaths in China in 2000,[2] 688,512 deaths were from the three major diseases attributable to smoking.[8] At RMB 0.25 million per lost life, the total indirect cost of smoking using the WTP approach is RMB 172 billion (*RMB 0.25 million x 688,512 = RMB 172 billion, or US$ 21 billion*). Adding RMB 14 billion (US$ 1.7 billion) for the direct cost of smoking, the total economic cost of smoking in China would be RMB 186 billion (US$ 22.6 billion), about 1.9 percent of China's GDP in the year 2000. To reduce this cost burden in the future, effective tobacco control programs and sustained efforts are needed to curb the tobacco epidemic and economic losses.

One of the most important instruments a government can use in tobacco control is taxation. Worldwide experience has shown that raising the specific tax on cigarette sales is very effective in reducing consumption.

Framework Convention on Tobacco Control (FCTC) and China

The Chinese government joined most of the world in supporting tobacco control by signing the World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC) in 2003. The National People's Congress ratified the treaty in 2005. Public statements from senior Chinese officials have indicated that the Chinese government is increasingly aware of the health risks of the high prevalence of smoking and is ready to address the mounting health crisis. However, in all the discussions and policy initiatives related to the implementation of the FCTC, there has been little or no mention of increasing taxation on cigarettes. The focus instead is on non-price tobacco control measures (i.e., banning smoking in public places, banning youth smoking, printing larger warning labels, banning tobacco advertising, etc.). One of the most important instruments a government can use in tobacco control is taxation. Worldwide experience has shown that raising the tax on cigarette sales is very effective in reducing consumption.[10] The FCTC requires that signatory countries recognize the effectiveness of price and tax measures in reducing consumption of cigarettes and be committed to implementing such price and tax policies.

Endnotes for Chapter I

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II. Price, Consumption, and Household Expenditures

Price, Affordability, and Consumption

Price

The price of cigarettes is a key variable when considering the use of taxation as an instrument for tobacco control because affordability influences consumers' decision to smoke. To examine the trends in the affordability of cigarettes, a weighted retail price per pack was used, as shown in Table 2.1. The weight is the amount of cigarettes of different brands consumed, based on data collected by the China National Tobacco Company (CNTC). The weighted price is the product of their respective prices. In China, the retail price of cigarettes includes taxes. In 1990, the nominal retail price per pack was RMB 1.088; it then gradually increased to RMB 4.522 in 2005. According to the Consumer Price Index (CPI), using data from 1990 as 100, the overall price level increased 2.14 times during that period. If one uses the CPI to deflate the nominal cigarette price,[11] the per pack price in 2005, measured at the 1990 price level, was RMB 2.11 per pack, as shown in Graph 2.1.

Table 2.1: Cigarette Prices, Affordability Index, and Consumption

Year	Nominal retail price (RMB/pack)	Consumer Price Index (1990=100)	Real retail cigarette price (1990=100) (RMB/pack)	Proxy disposable income per capita (RMB)	Affordability Index	Per capita consumption (packs/year)
1990	1.088	100.0	1.088	1637	1.000	65.97
1991	1.207	103.4	1.168	1884	1.038	67.64
1992	1.328	110.0	1.207	2298	1.150	66.15
1993	1.421	126.2	1.126	2975	1.391	68.99
1994	1.564	156.6	0.998	4014	1.706	68.29
1995	1.736	183.4	0.946	4938	1.890	70.17
1996	1.944	198.6	0.979	5731	1.959	67.77
1997	2.177	204.2	1.066	6314	1.928	68.54
1998	2.316	202.5	1.144	6654	1.910	65.82
1999	2.464	199.7	1.234	7034	1.897	64.50
2000	2.585	200.5	1.289	7732	1.988	60.95
2001	2.793	201.9	1.383	8467	2.015	64.60
2002	3.086	200.3	1.541	9271	1.997	68.09
2003	3.420	202.7	1.687	10460	2.033	69.57
2004	3.899	210.6	1.851	12277	2.093	72.09
2005	4.522	214.4	2.109	14128	2.076	71.81

Sources:
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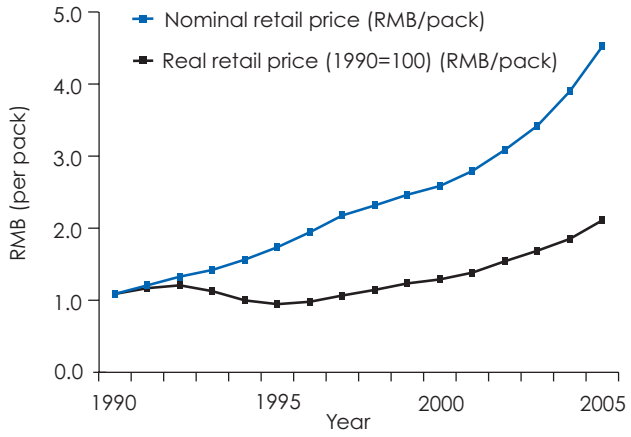
Graph 2.1: Nominal and Real Retail Price of Cigarettes in China (1990–2005)



Source: China Statistical Yearbook, 2005

Affordability

To address the affordability of cigarettes, one can divide per capita disposable income by the price per pack of cigarettes in each year. Then, using the base year (1990) ratio as a denominator for each subsequent year (e.g., 1991, 1992, etc.), one can derive an affordability index. No national per capita disposable income statistics are available in China, perhaps due to wide income disparities between urban and rural households. Therefore, to address the affordability issue at the national level, this paper uses the 2007 government revised gross national product figure, minus government fiscal revenue and divided by China's total population, as a proxy for per capita disposable income. With rapid economic growth in China between 1990 and 2005, the nominal proxy index of the per capita disposable income increased from RMB 1,637 in 1990 to RMB 14,128 in 2005 — about 8.63 times. Dividing the proxy index of per capita disposable income by nominal retail price per pack of cigarettes and using the 1990 price as a base provides the relative increase in income versus the relative increase in cigarette price. The affordability index is shown in Table 2.1. It indicates that Chinese consumers' incomes increased much faster than the price of cigarettes — by almost 2.08 times between 1990 and 2005. Thus, cigarettes became twice as affordable between 1990 and 2005, as shown in Graph 2.2.

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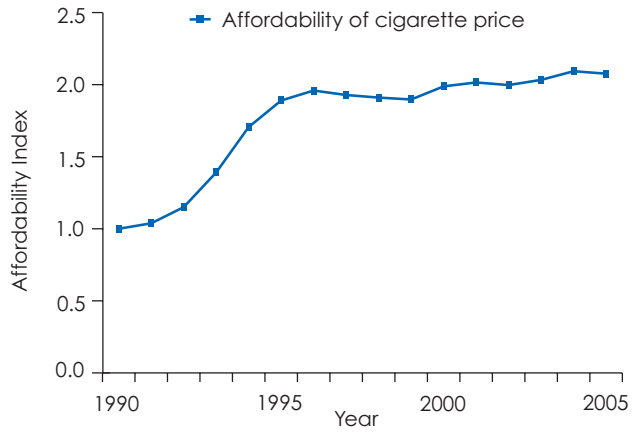
Guindon and others have addressed the "costliness" of tobacco products by dividing relative tobacco prices by a country's per capita gross domestic product (GDP).[12] This is the reverse of the affordability concept. The use of GDP as a denominator indicates its purchasing power over time. Their results indicated that between 1980 and 2000, cigarettes in Indonesia,

Graph 2.2: Affordability of Cigarette Price



Notes:
Affordability = disposable income per capita per cigarette price.
An increasing affordability index indicates that cigarettes are becoming more affordable.
Per capita disposable income relative to cigarette price and using 1990 = 1.00.
Higher the index = more affordable

Thailand, Sri Lanka, and India became 50 percent less costly or 50 percent more affordable. In China, using 1990 as a base, the "costliness" index dropped from 100 in 1990 to 47.4 percent in 2005.

Consumption

Between 1990 and 2005, per capita cigarette consumption in China fluctuated between 61 and 72 packs/year, with a median value of 67 packs/year. During 2004–2005, per capita consumption crept above 70 packs/year as shown in Table 2.1. Given that the relatively small increase in the real price has made cigarettes more affordable, per capita cigarette consumption may be increasing.

Household Tobacco Expenditures

Smoking increases the risk of cancers, cardiovascular disease, and other smoking-related illnesses that result in higher medical expenditures, lower productivity, and premature death. Many international studies have addressed this long term negative impact of smoking on health and personal welfare.

Smoking also has a short-term immediate negative impact on living standards by diverting scarce household resources from essential expenditures. Cigarette expenditures can reduce the nutritional status of low-income households by displacing expenditures on food. A 2002 survey examined expenditures among 3,400 Southwest China urban and rural households from 36 townships/districts and 108 villages.[13] Table 2.2 presents household expenditure patterns for major expenditures and cigarette consumption status by urban versus rural households, further separated by income groups.

As shown in Table 2.2, for both urban and rural households, the higher the household income, the higher the cigarette expenditures. These higher cigarette expenditures are reflected in both the amount of cigarette consumption and the price per pack paid by different income households. For example, in urban areas poor households consumed 7.6 packs of cigarettes a month, near-poor households consumed 9.8 packs a month, and non-poor households consumed 15.5 packs a month. Rural

Table 2.2: Urban and Rural Household Monthly Income Expenditure Patterns and Smoking Information, 2002

	Urban			Rural		
	Poor (n=140)	Near-poor (n=463)	Non-poor (n=1792)	Poor (n=146)	Near-poor (n=149)	Non-poor (n=534)
Monthly Average Income	502	780	2,769	226	325	863
Cigarette Expenditures (RMB)[a]	29	46	127	24	29	49
Percentage of Income on Cigarettes (%)	5.8	5.9	4.6	10.6	8.9	5.7
Cigarette Consumption (no. of packs)	7.6	9.8	15.5	21.8	24.1	28.8
Price per Pack (RMB)	3.8	4.7	8.2	1.1	1.2	1.7

Note:
Urban: Poor—monthly capita < RMB 143 (or US$ 0.60 per day); near-poor—RMB 144–286; non-poor— > RMB 286
Rural: Poor—monthly capita < RMB 54 (or US$ 0.22 per day); near-poor—RMB 53–83; non-poor— > RMB 83
[a] US$ 1 = RMB 8.23
Source:
Hu TW, Mao Z, Liu Y, de Beyer J, Ong M. Smoking, standard of living, and poverty in China. Tob Control. 2005;14:247–250.

households consumed more cigarettes than urban households: 21.8 packs a month for the rural poor households, 24.1 packs for near-poor, and 28.8 packs for non-poor. The differences in the amount of cigarette consumption between urban and rural consumers could be affected by price differences, as shown below.

Significant differences were found in the average prices paid per pack of cigarettes by smokers: RMB 3.8 for urban poor households, RMB 4.7 for urban near-poor households, and RMB 8.2 for urban non-poor households. On the other hand, the price per pack in rural areas ranged from RMB 1.1 for the poor households to RMB 1.7 for non-poor households — a much narrower price difference. The vast majority of low-priced brands are available in rural areas. Monthly cigarette expenditures were much higher for non-poor households than for poor ones.

The patterns are more consistent across rural and urban areas when one looks at the percentage of total *income* (rather than expenditures) spent on cigarettes. In both urban and rural areas, this percentage is higher for poor households than for non-poor households. Urban poor households spent 5.8 percent of their reported income on cigarettes compared to 4.6 percent in urban non-poor households. The differences are wider among rural households, with 10.6 percent spent in poor households versus 5.7 percent in non-poor households.

Using the total sample of households, a regression model was used to estimate the impact of smoking status on total household expenditures minus cigarette expenditures. The main components of interest were expenditures for food, housing, clothing, and education. The results indicated that if an urban household buys 15 packs per month, then it spends RMB 7.5 per capita less on food, RMB 6 per capita less on housing, RMB 3 per capita less on clothing, and RMB 2.25 per capita less on education. If a rural household buys 20 packs per month, then it spends RMB 10 per capita less on food, RMB 8 per capita less on housing, RMB 4 per capita less on clothing, and RMB 3 per capita less on education.

Table 2.3 compares the household expenditure patterns of smoking and non-smoking urban and rural poor/near-poor households from the same survey. The

results indicate that although the per family monthly expenditures between smoking and non-smoking households are quite comparable, poor/near-poor smoking households spent an extra RMB 46 on cigarettes in urban areas, and RMB 30 in rural areas. The extra expenditures on cigarettes constitute 7.7 percent of the total family expenditures in the urban poor/near-poor smoking households and 11.12 percent of the total family expenditures in rural poor/near-poor smoking households. Smoking households show a clear reduction in spending on other household necessities, such as food, housing, and

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Table 2.3: Comparison of Household Expenditures for Smoking and Non-smoking Urban and Rural Poor/Near-poor Households (RMB and percentages), 2002

	Urban (n=603)		Rural (n=295)	
	Smoking	Non-smoking	Smoking	Non-smoking
Total Expenditures per Family per Month (RMB)	595	609	269	259
Food	357	388	161	164
Housing	60	64	7	6
Clothing	33	21	19	18
Education	35	35	31	42
Cigarettes	46	–	30	–
Other *	64	101	21	30
	Percentages			
Total Expenditures per Family per Month (%)	100.00	100.00	100.00	100.00
Food	60.05	63.76	59.78	63.23
Housing	10.04	10.45	2.75	2.23
Clothing	5.47	3.49	6.90	6.87
Education	5.91	5.81	11.59	16.18
Cigarettes	7.70	–	11.12	–
Other[a]	10.83	16.49	7.86	11.49

Note:
Urban: Poor/Near-poor— monthly per capita < RMB 286
Rural: Poor/Near-poor— monthly per capita < RMB 83
US$ 1= RMB 8.23
[a] *Includes health care, transportation, household maintenance, and other expenditures*

Source:
Data collected for Hu TW, Mao Z, Liu Y, de Beyer J, Ong M. Smoking, standard of living, and poverty in China. Tob Control. 2005;14:247–250.

education. Therefore, if households stopped buying cigarettes, they could spend more money on essential goods.

In 2002, another 4,538 households were interviewed in Guizhou Province, where 6.5 percent of total household expenditures were spent on purchasing tobacco.[14] This study compared two types of households: those with tobacco expenditures and those without. Multivariate analysis revealed that for every RMB 100 spent on tobacco, households spent RMB 30 less on education, RMB 15 less on health care, RMB 14 less on housing expenditures, RMB 10 less on food, and RMB 31 less on other household items, such as clothing, transportation, entertainment, and other things. Tobacco expenditures not only result in a smoker's reduced consumption of other goods and services, but they also affect the well-being of other family members. The 2003 China National Health Services Survey data reported statistics for about 280 million households in China. Based on two previous studies,[13,14] it can be estimated that about 70 percent of the households (193 million households) in China incurred tobacco expenditures. With the above estimates of tobacco spending and its impact on other household expenditures, if each household spends RMB 400 on tobacco (a low estimate from Table 2.3), the result on a national level would represent RMB 24 billion less spent on education, RMB 12 billion less on health care, RMB 11 billion less on housing, and RMB 8 billion less on food. Compared to the 2003 China national total expenditures on education, health, housing, and food (RMB 620 million, RMB 658 billion, RMB 904 billion, and RMB 3,123, respectively), tobacco spending represents about 4 percent, 2 percent, 1 percent, and 0.2 percent of these four key national household expenditures, respectively. In addition to the negative impacts of smoking on health, smoking also results in negative consequences in terms of human capital investment (e.g., a reduction in educational expenditures), which will have a negative impact on the Chinese economy by reducing the future productivity of its citizens.

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Poverty and Low-income Smokers

In addition to the negative effect of smoking on health and productivity, smoking also impacts smoking-attributable medical spending, and direct spending on cigarettes has an impoverishing effect. The impact of smoking on poverty was estimated in a study that used the 1998 China National Health Services Survey data, which included national representation of 56,994 households.[15]

Since the poverty line is calculated differently for urban and rural residents in China, the poverty impact of cigarette smoking for urban and rural populations was estimated separately. Poverty was defined as earning less than RMB 54 per month per capita (US$ 0.22 per day) in rural areas and less than RMB 143 per month per capita (US$ 0.60 per day) in urban areas.[14]

The excessive medical spending attributable to smoking was estimated using a regression model of medical expenditures with smoking status (current smoker, former smoker, never smoker) as one of the explanatory variables, controlling for household demographic and socioeconomic characteristics. The poverty impact was measured by the changes in the

poverty head count after smoking-related expenses were subtracted from income.

The results indicated that the excessive medical spending attributable to smoking in 1998 may have caused the poverty rate to increase by 1.5 percent for the urban population and by 0.7 percent for the rural population. Therefore, during 1998, the number of poor people in urban and rural areas increased by an estimated 6.4 percent and 1.9 percent, respectively, due to direct household spending on cigarettes. Accordingly, the excessive medical spending attributable to smoking and consumer spending on cigarettes was estimated to be responsible for impoverishing 30.5 million urban residents and 23.7 million rural residents in China during the 1998 survey year. Smoking-related expenses contributed to moving a significant proportion of low-income families into poverty in China. Therefore, tobacco control is not only a public health strategy, but also a poverty reduction strategy.

The excessive medical spending attributable to smoking and consumer spending on cigarettes was estimated to be responsible for impoverishing 30.5 million urban residents and 23.7 million rural residents in China during the 1998 survey year.

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III. Tax System and Tax Structure

Tax System and Administration

China has a central government tax and a local government tax. The central government collects a value-added tax, personal and enterprise income tax, specific excise tax, consumption tax, and customs tax. The local government collects a business tax, special tobacco leaf tax, and city construction and maintenance tax. Two major government agencies are in charge of tax administration: the Ministry of Finance (MOF) and the State Administration of Taxation (SAT), both of which are under the State Council. The Ministry of Finance is responsible for setting tax and fiscal policy, distributing tax revenue to other government agencies, preparing the annual national budget, designing central and local government revenue-sharing, and together with SAT, proposing tax rate adjustments or new tax legislation. The State Administration of Taxation is solely responsible for tax collection, administering tax collection regulations, providing macro fiscal and tax analysis, and, together with MOF, advising on new tax policies. SAT is under the jurisdiction of the State Council but not on par with MOF. The two organizations, SAT and MOF, in consultation with the State Council, together propose new tax rates on the existing tax schedule. However, depending on the nature of the taxation, such as a cigarette tax, the Ministry of Health could work with MOF and SAT to introduce a new tax rate that would include provisions to earmark part of the tax revenue collected for health promotional uses, subject to the approval of the State Council. For a proposed tax to become a tax law, it must be approved through the State Council and/or be introduced as new legislation from the People's Congress.

Under the State Council there is a "super ministry" called the National Development and Reform Commission (NDRC), established in 2003. The NDRC determines economic and social policies and generates the five-year macroeconomic plan and associated budgets. Within the NDRC are divisions in charge of overall policy directions in areas such as health care reform and industrial operations, including the tobacco industry, oil industry, and automobile industry. The 2003 State Council directive specifically placed the State Grain Administration and the State Tobacco Monopoly Administration (STMA) under the jurisdiction of NDRC. For tobacco control, NDRC plays a key role in the future direction of the tobacco industry. The Deputy Director General of the Division of Economic Operations serves as the chair in China's Framework Convention on Tobacco Control (FCTC) Committee. Graph 3.1 is the organizational chart for the cigarette tax legislation process. The direction of the arrow indicates the chain of decision-making or command for tobacco control policies.

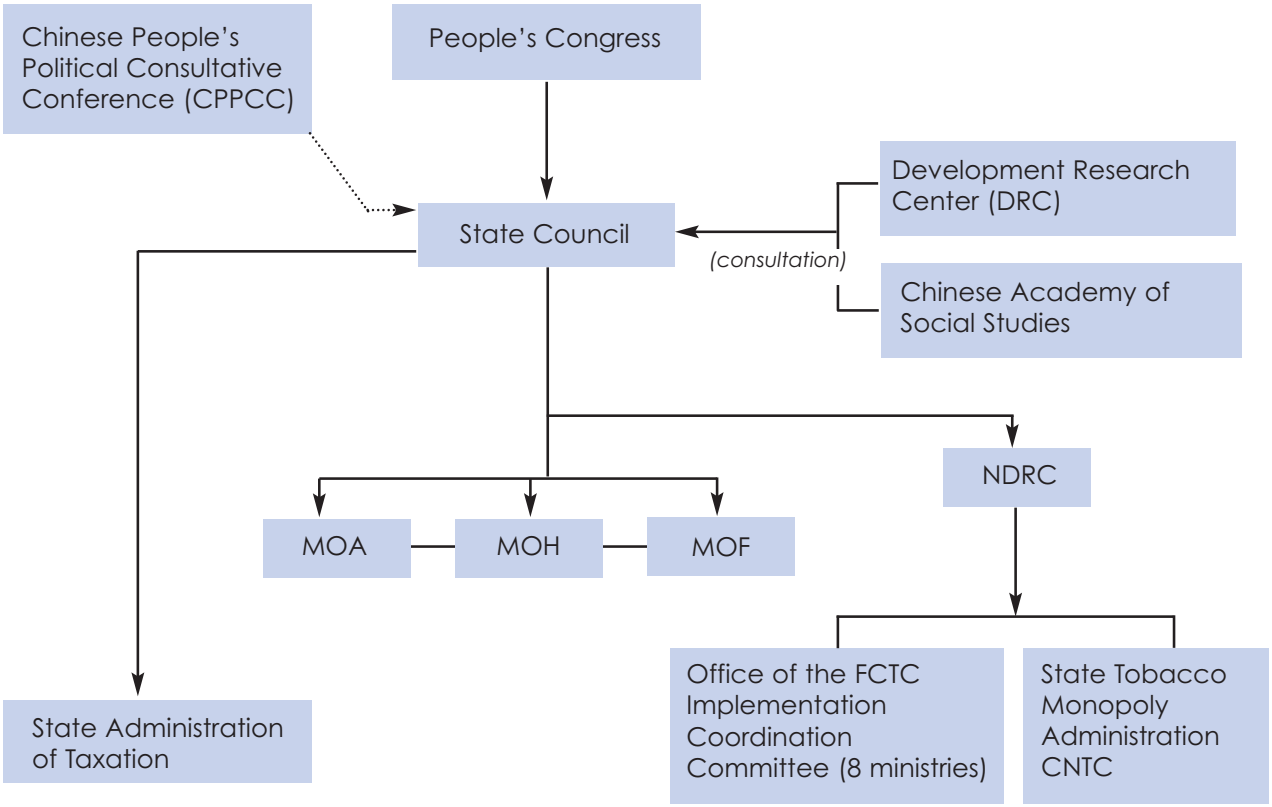
Even though the central government collects a large majority of the taxes in China, revenue from some collected tax categories is shared with the local government. This provides financial incentives for local government to collect taxes on behalf of the central government. China has two tobacco-oriented taxes: the tobacco leaf tax and the cigarette tax.

Tobacco Leaf Tax

Although tobacco leaf is a farm product, the Ministry of Agriculture in China has no jurisdiction with respect to its technical assistance, crop production, pricing, or marketing. The State Tobacco Monopoly Administration (STMA) and the Chinese National Tobacco Company (CNTC) have full control over tobacco leaf production and cigarette manufacturing.

Before 2005, tobacco leaf was included under the agricultural product tax, which was levied at 31 percent of the CNTC purchase price. The revenue from this special agricultural tax was collected and used for local

Graph 3.1: Tobacco Tax Policy Organizational Chart



Note:
MOA: Ministry of Agriculture
NDRC: National Development and Reform Commission
MOF: Ministry of Finance
MOH: Ministry of Health
CNTC: China National Tobacco Company
FCTC: Framework Convention on Tobacco Control
Arrow: indicates the chain of decision-making
Dotted line: represents an advisory relationship
Within each government unit, a Department of Law and Regulation is in charge of drafting legislation.

government purposes. In 2006, the central government decided to eliminate all agricultural product taxes to relieve farmers' financial burdens. However, tobacco leaf was not included in the tax exemption. Instead, it was redesigned as a special tobacco leaf tax, and the tax rate was reduced from 31 percent to 20 percent.[16] The central government used two arguments for retaining the tobacco leaf tax: (1) it is a macroeconomic instrument to control tobacco production and tobacco consumption, and (2) it provides a major source of revenue for local government. These tax revenues are withheld by CNTC at the point of tobacco leaf procurement by the Chinese National Tobacco Company. CNTC turns over the retained tax revenue to the local government.

In 2005, Chinese local government collected RMB 3.74 billion in tobacco leaf tax, about 0.013 percent of the total local government revenue. However, some key tobacco-producing provinces, such as Yunnan, collected about RMB 1.11 billion from tobacco leaf production, or more than 10 percent of all Yunnan's provincial government revenue. Guizhou collected RMB 518 million, followed by Henan with RMB 470 million and Sichuan with RMB 168 million.[17]

As will be discussed in Chapter VI, the opportunity for local government to collect more tax revenue has been a pervasive incentive for it to seek increased production of tobacco leaf at the local level.

Cigarette Tax

The year 1994 was very important for reform of the tobacco tax system in China. That year, a 17 percent value-added tax (VAT) was introduced at the cigarette production level, and an additional 40 percent cigarette tax (in this paper we will refer to it by its common term: consumption tax) was collected at the wholesale price level.[18] The value-added tax applies to additional labor and supplies that contribute to cigarette manufacturing above and beyond the value of tobacco leaf. It is a common tax that the Chinese government has imposed on all commodities in the economy. In 1998, the 40 percent cigarette tax was revised into three different excise tax rates: a 50 percent tax rate for top-grade cigarettes (class 1), 40 percent for middle-grade (classes 2 and 3), and 25 percent for low-grade (classes 4 and 5).[18]

In 2001, with the approval of the State Council, MOF and SAT recommended that the cigarette tax rate be revised into two components:

(1) A specific tax of RMB 150 per case (50,000 cigarettes or 2500 packs; or, RMB 0.06 per pack) for all cigarettes, and

(2) An *ad valorem* tax of 45 percent for cigarettes with a producer price higher than or equal to RMB 50 per carton (or RMB 5 per pack) — brands such as Panda and Zhonghua, for example — and a 30 percent tax rate for cigarettes with a value less than RMB 50, which includes many local brands.

The first type of tax is based on quantity, which is a form of specific excise tax, and the second type of tax is based on price, which is a form of *ad valorem* tax. The sales price is the transaction price between cigarette manufacturers and wholesalers, which does not include the value-added tax. In other words, the current cigarette tax system in China combines a value-added tax, a specific excise tax, and an *ad valorem* tax. This specific excise tax is a special tax applied to only eleven consumer commodities, including automobiles, fuel, jewelry, cosmetics, alcohol, and cigarettes. Each commodity has its own specified tax rate.

Combining VAT, the specific excise tax, and the *ad valorem* tax, the Chinese government states that China's cigarette tax is about 65 percent at the producer price level.[18] Using the t/(t+1) formula to calculate the tax rate and presuming a 65 percent tax rate (t) at the producer price, the total tax rate would be about 40

Although the precise total tax rate as a percent of retail price is uncertain, it is likely between 32 percent and 40 percent, both proportions that are far below the median range of tax rates of the international community, which is between 65 percent and 70 percent.

percent at the retail price level. There are other important factors that could mean that the total tax rate is lower, such as the distribution margin, however these data are not currently available. Taking into consideration international practice[19], an assumption can be made that the distribution margin equals to 25 percent of the producer price, while *ad valorem* excise tax equals 30 percent of the producer price. Together they would bring down the total tax on low-priced cigarettes to about 32 percent of the average retail price. However this estimate does not include the CNTC's contribution to Chinese government in the form of the City Construction Fee and Educational Supplement Fee. Although the precise total tax rate as a percent of retail price is uncertain, it is likely between 32 percent and 40 percent, both proportions that are far below the median range of tax rates of the international community, which is between 65 percent and 70 percent.[20] A tax rate of 40 percent of the retail price is used for subsequent analysis in this report.[20]

Sunley has estimated the 2005 cigarette tax burden across several countries in the Asia-Pacific region, using the amount of tax per 1,000 cigarettes as a numerator and per capita GDP (as a purchasing power parity, PPP) as a denominator.[21] Applying this method, in China the cigarette tax per 1,000 cigarettes would be RMB 80 (RMB 1.61 per pack for 50 packs), or the equivalent of US$ 9.80. China's per capita GDP in 2005 was RMB 14,002 (or US$ 1,707). The ratio between tax per capita GDP (in thousands) shows a tax burden ratio of 5.74 (9.8/1.7) for China, compared to 6.16 for Australia, 8.11 for Singapore, and 8.24 for New Zealand. In other words, China has a lower tax burden with respect to cigarettes.

The Chinese import tax on foreign cigarettes is essentially the same as the domestic consumption tax rate on cigarettes. The Chinese Customs Office first levies a specific excise tax, regardless of the price of the cigarettes, at RMB 150 per case (or RMB 0.06 per pack). Then, based on the import price of the cigarettes (including the customs tax), one of two different tax rates is applied — 45 percent for those with an assessed import price equal to or greater than RMB 50 (per carton) or 30 percent for those priced less than RMB 50 (per carton). Table 3.1 provides a summary of the tobacco tax structure in China.

Under the 1994 tax reform, to maintain sufficient local government revenue, the central government transfers 25 percent of the consumption tax revenue to local government. This form of tax revenue-sharing provides an incentive to local government to protect their local tobacco industry by controlling tobacco leaf production, marketing, and pricing. The national tobacco monopoly industry thus becomes many localized monopolies.

The tobacco industry's contribution to the central government's collected revenues makes it the object of significant attention by the Chinese government. The China National Tobacco Company (CNTC) is a government-owned monopoly that combines both its profit and tax revenue in its accounting of revenue. The CNTC does not provide a public report separating profit and tax. Table 3.2 provides the tax and a portion of profit contributions from the China National Tobacco Company to the Chinese government since 1990. In 1995, the tobacco industry contributed about 11.4 percent of total central government revenue; its contribution declined to 7.6 percent in 2005. However,

Table 3.1: Tobacco Tax Structure in China

Type of tax, tax base	Tax rate	Revenue beneficiary
1. Tobacco leaf tax (since 2006)	20%	100% local government
2. Value-added tax at cigarette manufacture (since 1994)	17%	75% central government 25% local government
3. (i). Specific excise tax (since 2001)	RMB 0.60 / carton (or RMB 0.06 / pack)	100% central government
(ii). *Ad valorem* tax (since 2001)		
≥ RMB 50 per carton[a]	45%	100% central government
< RMB 50 per carton	30%	

Note:
[a] per carton = 10 packs or 200 cigarettes.

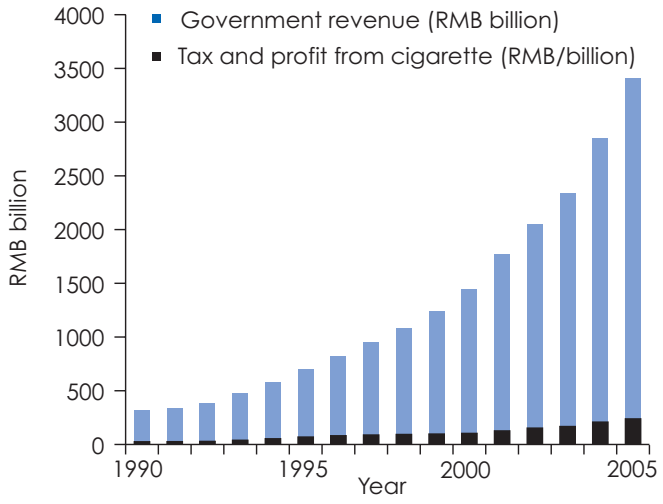
Table 3.2: Cigarette Tax and Distributed Profits to the Government in China, 1990–2005

Year	Cigarette tax and profit (RMB billion)[a]	Government revenue (RMB billion)	Proportion of cigarette tax and profit to government revenue
1990	27.0	293.7	9.2
1991	28.0	314.9	8.9
1992	30.5	348.3	8.8
1993	41.0	434.9	9.4
1994	55.0	521.8	10.5
1995	71.0	624.2	11.4
1996	83.0	740.8	11.2
1997	90.0	865.1	10.4
1998	95.0	987.6	9.6
1999	98.9	1144.4	8.6
2000	105.0	1339.5	7.8
2001	128.1	1638.6	7.8
2002	154.1	1890.4	8.2
2003	169.0	2171.5	7.8
2004	210.0	2639.6	8.0
2005	240.0	3164.9	7.6

Note:
[a] Cigarette tax and the CNTC distributed profits that are part of government revenue.
Source:
China National Tobacco Company

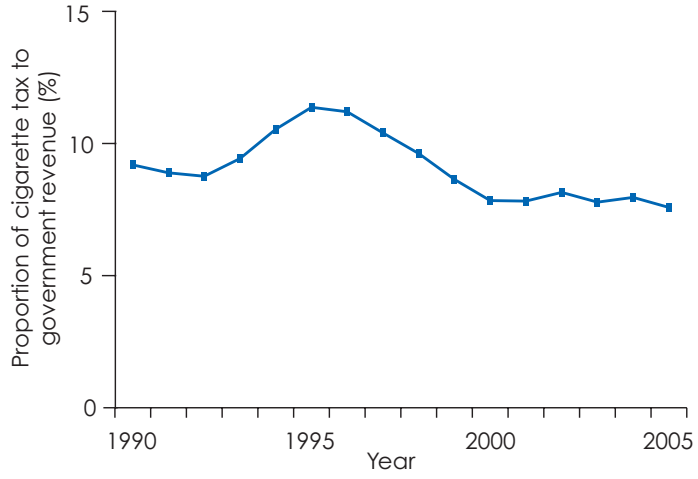
even though the relative share for the tobacco industry has been declining, the tobacco industry is still a very important source of revenue for the central government. Graph 3.2 provides the growth pattern of the cigarette tax and government revenue. Graph 3.3 provides the percent of the cigarette industry's

Graph 3.2: Cigarette Tax and Distributed Profit to Government Revenue in China (1990–2005)



Source: Data from Table 3.2.

Graph 3.3: Proportion of Cigarette Tax and Distributed Profit to Total Government Revenue (1990–2005)



Source: Data from Table 3.2.

contribution to central government revenues. The decline in the percent of tobacco's contribution to central government revenue is the result of recent rapid economic development in China's petroleum, textile, automobile, and high tech industries.

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IV. Role of Tobacco Tax in Demand, Government Revenue, and Population Health

Demand Analysis and Price Elasticity

Determining the impact of taxation on cigarette consumption and subsequently on government revenue requires an analysis of the relationship between price and consumption of cigarettes, which can be expressed in quantitative terms. Price elasticity measures the effect on consumption of a change in price. Price elasticities are obtained statistically by estimating a demand function for a product. A typical demand function for cigarettes includes the price of the cigarettes, personal disposable income, and a set of sociodemographic characteristics, including age, gender, and education, among others.

Estimates of the price elasticity of the demand for cigarettes can vary widely depending on the type of data (aggregate time-series data versus individual-level survey data), time period of the data, model specification, and estimation method. Two approaches can be used to analyze the demand for cigarette smoking: one is based on aggregate time-series data (and/or pooled aggregate data over a time period), and the other is based on individual-level data taken from a cross-sectional survey.

Some previous studies of the demand for cigarettes in China have been based on aggregate time-series data. The unit of observation is either all of China or a single province. The measure of cigarette consumption is per capita cigarette sales. Several problems are inherent in using aggregate time-series data. First, potential key determinants of cigarette consumption, such as race, gender, and education, are typically omitted from the model due to the aggregate nature of time-series data; also, aggregated values of these variables do not vary appreciably over time so they do not show significant effects. Second, tax-paid cigarette sales data do not exactly reflect actual consumption, since the potential for smuggling could cause upward-biased estimates for the negative impact of cigarette price on cigarette demand. Time-series data are relatively easy to obtain but may not provide a sufficient time period for reliable analysis, as they are often limited to annual observations.

A number of Chinese studies have used individual-level cross-sectional survey data, which can provide a much larger sample size, and these data include detailed sociodemographic variables. Cross-sectional data allow for the evaluation of the effects of cigarette price on the demand for cigarettes among different demographic and socioeconomic subgroups of the population. Since the data include both nonsmokers and smokers, cross-sectional data allow for examining the separate effects of cigarette price on smoking status (no smoking versus smoking) and cigarette price on the amount of cigarette consumption among smokers. However, the main challenge with these data is their potential bias from self-reported price variables and/or the lack of price variables for nonsmokers. Correcting this bias requires statistical methods (such as instrumental variables) or reliance on publicly reported cigarette price information to be matched with individual respondent locations.

A brief review of past studies on the demand for cigarettes in China helps determine the magnitude of price elasticities to use to simulate the effect of cigarette price changes (through various changes in the cigarette tax) on cigarette consumption, government revenue, population health, and the overall cigarette economy.

There are three time-series studies on the demand for cigarettes in China, as shown in Table 4.1. All used price and income (adjusted by inflation) as explanatory variables. Some models added a lagged dependent variable (past period consumption) as an additional explanatory variable to estimate the short-term and long-term price effect. Mao and Jiang first analyzed the price-demand relationship for cigarettes in Sichuan Province using aggregate data for 1981–1993.[22] Their estimated price elasticity was between −0.47 and −0.80. A price

elasticity of –0.47 implies that a 10 percent increase in price will lead to a 4.7 percent reduction in cigarette consumption. Instead of using provincial data, Hu and Mao used national time-series data of annual per capita cigarette sales from 1980–1996 to analyze per capita consumption in China. They found an overall estimated price elasticity of –0.54, with a short-term price elasticity of –0.35 and a long-term price elasticity of –0.66.[23] In this case, there is a difference between the short-term response and the longer-term response to a price increase. In the short term, smokers would respond to a 10 percent price increase with a smaller reduction of 3.5 percent in cigarette consumption, compared to a 6.6 percent reduction in the longer term with the same 10 percent price increase. A recent time-series analysis by Mao, Hu, and Yang using 1980–2002 national data produced an estimated price elasticity of –0.18 in the short-term and –0.61 in the long-term.[24] All these estimated price elasticities are statistically significant.

Pooled time-series and cross-sectional provincial (and special district-) data between 1997–2002 were used by Bai and Zhang to estimate the price elasticity of the demand for cigarettes in China.[25] The estimated price elasticity was –0.84, as shown in Table 4.1.

Table 4.1: Summary Estimates of Price Elasticities of Demand for Cigarettes in China[a]

Data Type	Author(s)	Time Period	Unit of Analysis	Estimates
Aggregate time series	Mao, Jiang[b]	1981–1993	Sichuan	**–0.47**, **–0.80**
	Hu, Mao[b]	1980–1996	National	**–0.54** –0.35 (short-term) –0.66 (long-term)
	Mao, Hu, Yang[d]	1980–2002	National	**–0.18** (short term) **–0.61** (long-term)
Pooled cross-section/ time series	Bai, Zhang[e]	1997–2002	Provincial and special municipalities	**–0.84**
Cross-section	Mao, Jiang[f]	1995	Household (Sichuan Province)	**–0.69**
	Mao, Yang, Ma[g]	1998	16 Counties (individual)	**–0.514**
	Lance, Akin, Dow, Loh[h]	1993–1997	Household (9 provinces)	**–0.007** **–0.082**
	Mao, Hu, Yang[i]	2002	National (individual)	**–0.154** –0.064 (quitting) –0.09 (amount reduction)

[a] *Note: The large variations among price elasticities (e.g., mostly due to price variation among brands and income distribution), and survey models*

Sources:

[b] *Mao ZZ, Jiang JL. Demand for cigarette and pricing policy [in Chinese]. Chinese Health Economics. 1997;16: 50–52.*

[c] *Hu TW, Mao Z. Effects of cigarette tax on cigarette consumption and the Chinese economy. Tob Control. 2002;11:105–108.*

[d] *Mao Z, Hu TW, Yang GH. New estimate of the demand for cigarettes in China [in Chinese]. Chinese Journal of Health Economics. 2005;24:45–47.*

[e] *Bai Y, Zhang Z. Aggregate cigarette demand and regional differences in China. Applied Economics. 2005;37:2523–2528.*

[f] *Mao ZZ, Jiang JL. Determinants of the demand for cigarettes: A cross-sectional study [in Chinese]. Chinese Health Service Management. 1997;13:227–229.*

[g] *Mao Z, Yang GH, Ma H. Adults' demand for cigarettes and its determinants in China [in Chinese]. Soft Science of Health. 2003;17:19–23.*

[h] *Lance P, Akin J, Dow W, Loh CP. Is cigarette smoking in poorer nations highly sensitive to price? Evidence from Russia and China. Journal of Health Economics. 2004;23:173–189.*

[i] *Mao Z, Hu TW, Yang GH. Price elasticities and impact of tobacco tax among various income groups [in Chinese]. Chinese Journal of Evidence-Based Medicine. 2005;5:291–295.*

Among the cross-sectional studies, Mao and Jiang first analyzed the 1995 household survey data in Sichuan Province. Their estimated price elasticity was −0.69.[26] Mao, Yang, and Ma estimated adults' demand for cigarettes using individual-level data from a 1998 survey collected from 16 counties in China.[27] Their estimated price elasticity was −0.514 for all respondents, −0.507 for the group with a family income of at least RMB 500 per month (US$ 61), and −0.775 for the group with income less than RMB 500 per month.[27] Lance, Akin, Dow, and Loh addressed the question of whether cigarette smoking in developing countries was sensitive to price by using cross-sectional household provincial data from the 1993–1997 China National Health and Nutrition Survey to examine the demand for cigarettes among male adults. Their estimated price elasticities ranged from −0.007 to −0.082, depending on the model specification.[28] Mao, Hu, and Yang used data from a nationally representative Smoking Prevalence Survey in 2002 to estimate both the price elasticity of smoking status and the price elasticity of the demand for cigarettes among current smokers. Using the two-part model estimation for all respondents, the price elasticity of being a smoker was −0.064, and the price elasticity of the demand for the amount of cigarettes conditional on being a current smoker was −0.09. The total price elasticity was statistically significant at −0.154 [− (0.064 + 0.09) = −0.154].[29] Therefore, approximately 40 percent of the decline in cigarette consumption was from a decrease in the number of smokers, and about 60 percent of the decline was from current smokers smoking less. These ratios fall within the range found in the international literature, which varies from one third to one half of smokers having quit smoking and one half to two thirds of smokers reducing consumption.[30]

One possible explanation for the low magnitude of price elasticity in China is the availability of cigarettes with a wide range of prices, from RMB 1.0 to RMB 100 per pack, suggesting that smokers can easily switch to lower priced brands without quitting.

Table 4.1 provides summary results of the time-series, pooled time-series/cross-sectional, and cross-sectional studies reviewed. These estimated price elasticities ranged from −0.007 to −0.84. However, they can be summarized into three categories based on their magnitudes. (1) The high end of price elasticity, around −0.80, was obtained from two of eight studies. Although international literature often cites −0.80 as the magnitude of price elasticity among developing countries, it seems unlikely that Chinese smokers would have such a high response to price change in the short-run; this could be, however, a long-run price elasticity.[31] (2) The middle range of price elasticity, from −0.50 to −0.60, represents almost half of all estimated results, and is cited mostly in the literature in middle- or high-income countries. (3) The low end of price elasticity, from −0.007 to −0.154, is from the most recent Chinese studies and built upon much larger nationally representative data sources. Demand analysis from a 2005 nationally representative special survey on tobacco consumption from 60,000 Chinese households, conducted by the State Statistical Bureau on behalf of CNTC, also obtained a relatively low participation elasticity (ranging from −0.10 to −0.26) and cigarette consumption elasticity of demand for cigarettes among smokers (between −0.072 and −0.080).[32] One possible explanation for the low magnitude of price elasticity in China is the availability of cigarettes with a wide range of prices, from RMB 1.0 to RMB 100 per pack, suggesting that smokers can easily switch to lower priced brands without quitting. Since the magnitude of price elasticity is one of the most important parameters used to simulate the impact of a cigarette tax on cigarette consumption, government revenue, population health, and the overall economy, it would be useful to choose two different price elasticities of −0.15 and −0.50 for a short-run tax impact sensitivity analysis.

Baseline data from 2005 were used to carry out the simulation analysis. As shown in Table 2.1, the nominal retail price per pack of cigarettes in 2005 was RMB 4.52. As noted, in China the tax is included in the retail price because the country has no retail sales tax system. The 40 percent tax rate at the retail level was estimated in Chapter III. The retail price (Pr) and tax rate (t) relationship can be expressed as follows:

$$Pr = Pn / (1 - t)$$

where Pn is the price net of tax (wholesale price). Given that Pr is RMB 4.52, t = 0.40, the Pn is equal to RMB 2.71, and the tax is RMB 1.81. In 2005, per capita cigarette consumption (for the entire population) was 72 packs, as shown in Table 2.1. Thus, the total cigarette consumption in China was 94.1 billion packs. Multiply the tax per pack (RMB 1.81) by the total packs (94.1 billion), and the estimated government cigarette tax revenue was RMB 170.2 billion (US$ 20.7 billion), as shown in Table 4.2.

China has two forms of taxes on cigarettes, a specific excise tax (currently RMB 0.06 per pack) and an *ad valorem* tax (45 percent for Pn ≥ RMB 5 per pack, and 30 percent for Pn < RMB 5 per pack). The current specific excise tax is too low to have much impact on tobacco consumption. To achieve the goal of discouraging consumption of cigarettes, a strong and a substantial amount of specific excise tax, automatically indexed to inflation, should be introduced. Specific excise taxation is highly predictable and it is easier to administer. Given the wide range of cigarette prices, a substantial increase in a specific excise tax would reduce the relative range although it would have less effect on smokers of high-priced cigarettes. Because China also has an *ad valorem* tax in place, it would be useful to keep the *ad valorem* tax and to introduce a uniform *ad valorem* tax rate to replace the current two-tier tax system. Ideally, the simulation would include both the increase in the specific excise tax together with the additional uniform *ad valorem* tax. With the lack of detailed micro-level data on cigarette consumption by prices and their respective consumption, the simulation below is limited only to an additional increase in the specific excise tax of RMB 1, RMB 2, RMB 3, and RMB 4. Due to China's very low specific excise tax rate (RMB 0.06 per pack), Chinese tax experts recently considered that an initial cigarette tax reform would most likely begin with an increase in the specific excise tax while *ad valorem* tax. The simulation model includes four scenarios: increase of RMB 1 per pack (from RMB 4.52 to RMB 5.52), RMB 2 per pack (from RMB 4.52 to RMB 6.52), RMB 3 per pack (from RMB 4.52 to RMB 7.52), and RMB 4 per pack (from RMB 4.52 to RMB 8.52). Assuming this tax increase will be fully passed on to the retail price, the resulting tax rate at the retail level would be 51 percent, 58 percent, 64 percent, and 68 percent, respectively. Note that these percentage estimates are based on current publicly available Chinese cigarette tax rates and the average weighted retail price. The same simulation methods could be applied if there were different cigarette tax rates and retail prices in China.

With a 1 RMB per-pack tax increase... with a total price elasticity of –0.15... the prevalence rate of smoking would be reduced from 30 percent to 29.6 percent, representing a reduction of 4.1 million smokers. ... a 1 RMB specific excise taxincrease would mean 1.025 million lives would be saved.

Simulation of Impact of Specific Excise Tax Increases on Cigarette Consumption, Government Tax Revenue, and Health

To assess the potential impact of raising cigarette taxes on the smoking prevalence rate, number of lives saved, and government tax revenue in China, simulation analyses were performed based on two different price

Table 4.2: Simulation of Impact of Cigarette Tax Increases on Tobacco-attributable Mortality and Government Tax Revenue

		Increases in Specific Excise Tax[a]			
	Current levels	**1 RMB**	**2 RMB**	**3 RMB**	**4 RMB**
Cigarette Retail Price (RMB/pack)	**4.52**	5.52	6.52	7.52	8.52
Total Tax (RMB/pack)[a]	**1.81**	2.82	3.82	4.82	5.82
Total Tax Rate as % of Retail Price	**40%**	51%	58%	64%	68%
Reduction in Number of Smokers (million) Price Elasticities[b]					
–0.15		4.1	8.2	12.3	16.4
–0.50		13.7	27.3	41	54.6
Number of Lives Saved (million)[c]					
–0.15		1.0	2.1	3.1	4.1
–0.50		3.4	6.8	10.2	13.7
Prevalence of Adult (aged 15+) Current Smokers	**30%**				
–0.15		29.6%	29.2%	28.8%	28.4%
–0.50		28.7%	27.3%	26.0%	24.7%
Total Number of Current Smokers (million)	**308.8**				
–0.15		304.7	300.6	296.5	292.4
–0.50		295.1	281.4	267.8	254.1
Additional Tax Revenues from Specific Excise Tax (billion RMB)					
–0.15		85.4	164.5	237.4	303.9
–0.50		64.9	109	132.2	134.6
Total Annual Cigarette Tax Revenue (billion RMB)	**170.2**				
–0.15		255.6	334.7	407.6	447.2
–0.50		235.1	279.1	302.4	304.8
Additional Tax Revenues from Specific Excise Tax (billion USD)[d]					
–0.15		10.4	20.1	29.0	37.1
–0.50		7.9	13.3	16.1	16.4
Total Annual Cigarette Tax Revenue (billion USD)[d]	**20.8**				
–0.15		31.2	40.8	49.7	54.5
–0.50		28.7	34.0	36.9	37.2

Notes:

[a] *While keeping the current ad valorem tax structure intact.*

[b] *Smoking participation elasticity = 40% of the total price elasticity; smoking intensity elasticity = 60% of the total price elasticity.*

[c] *Assuming 25% reduction in smokers, World Bank. Curbing the Epidemic: Government and the Economics of Tobacco Control. Washington DC: World Bank, 1999:23.*

[d] *US$ 1 = RMB 8.20 at the 2000 exchange rate.*

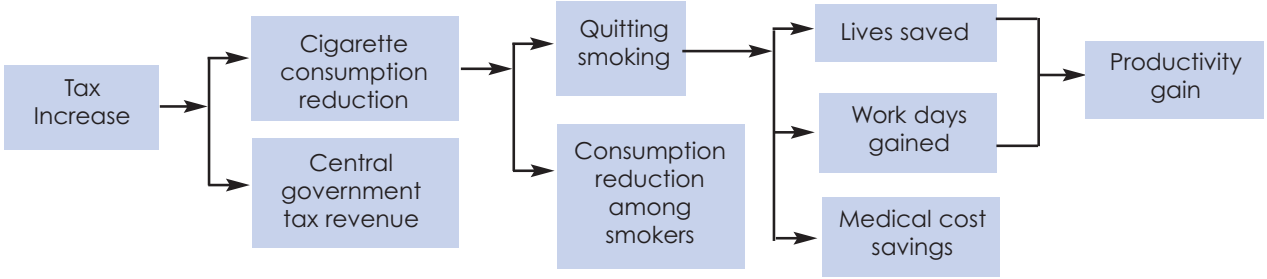
elasticities: –0.15 and –0.50. Table 4.2 presents the simulated results using a price elasticity of –0.15 and –0.50, respectively, when the tax is increased by RMB 1, RMB 2, RMB 3, and RMB 4. Graph 4.1 provides a conceptual framework of the simulation analysis.

With a 1 RMB per-pack tax increase, or at a retail price of RMB 5.52 per pack, which is equivalent to 51 percent of the retail price level, with a total price elasticity of –0.15, smoking participation elasticity would be –0.06, and the prevalence rate of smoking would be reduced from 30 percent to 29.6 percent, representing a reduction of 4.1 million smokers. Using the estimated epidemiology analysis reported by the 1999 World Bank report,[10] assuming 25 percent of smokers will die from tobacco-related illness, a 1 RMB specific excise tax increase would mean 1.025 million lives would be saved. At the same time, the total government cigarette tax revenue would be RMB 255.6 billion (US$ 31.2 billion), an increase of RMB 85.4 billion (US$ 10.4 billion).

The same methodology was used to estimate the impact on cigarette consumption, health, and government revenue of adding an excise tax of 1 RMB per pack, assuming a total price elasticity of –0.50 (i.e., smoking participation elasticity at –0.20). In this scenario, the prevalence rate of smoking would be reduced further from 30 percent to 28.67 percent, or a reduction of 13.7 million smokers. Assuming 25 percent of smokers will die from tobacco-related illness, an additional 1 RMB specific excise tax would mean 3.42 million lives could be saved. The total government cigarette tax revenue would then be RMB 235.1 billion (US$ 28.7 billion), representing an increase of RMB 64.9 billion (US$ 7.9 billion).

Similar simulation methods were used to examine the impact of an additional 2 RMB specific excise tax per pack (tax at a retail price of 58 percent), a 3 RMB excise tax per pack (tax at a retail price of 64 percent), and a 4 RMB excise tax per pack (tax at a retail price of 68 percent). Table 4.2 shows that the number of smokers would be reduced by up to 16.4 million when an additional RMB 4 is added to the cigarette price, when the price elasticity is –0.15; 4.1 million lives could be saved, and government tax revenue would be increased by RMB 303.9 billion (US$ 37.1 billion). With the same magnitude of tax increase but a higher price elasticity (–0.50), more smokers will quit (54.6 million at –0.50 elasticity with a 4 RMB tax versus 16.4 million at –0.15 elasticity), and more lives (13.7 million) will be saved. Government cigarette tax revenue would increase at a –0.50 price elasticity (by RMB 304.8 billion) but less than the amount when the price elasticity is at –0.15 (RMB 447.2 billion or US$ 54.56 billion).

Graph 4.1: Conceptual Framework for Simulation of Impact of Cigarette Taxation on Cigarette Consumption, Government Revenue, and Population Health



Therefore, a tax increase on cigarettes would save lives, reduce medical care costs, increase productivity, and increase government revenue in China.

Note that in this simulation model, the underlying assumption is that the elasticities are constant over a large range of price increases, a reasonable assumption supported by international literature.[31] Table 4.2 indicates the importance of the magnitude of price elasticity and the impact of the tax rate on cigarette consumption and government tax revenue. Given a price elasticity, the higher the tax rate, the greater the reduction of smokers and the greater the reduction in cigarette consumption. However, as price elasticity becomes high, higher tax rates will still lead to a reduction in cigarette consumption, although the rate of increase in government tax revenue will decline.

Not included in Table 4.2 are potential cost savings in medical services and increased productivity attributable to the increase in tobacco tax due to the decreased number of smokers. Under the cost of smoking analysis,[8] per smoker medical costs were about RMB 200 (US$ 24.4). Thus, 4.1 million fewer smokers would result in savings of RMB 820 million (US$ 100 million) in medical costs when the price elasticity is at −0.15 and the specific excise tax is raised an additional RMB 1 per pack, as shown in Table 4.2. If the price elasticity is −0.50, the additional medical cost savings with an additional 1 RMB tax increase would be RMB 2.68 billion (US$ 0.33 billion), rising to (include amount here) for a tax of 4 RMB at a price elasticity of −0.50.

The indirect cost of smoking in China, estimated by the human capital approach of premature death, is RMB 2,935 million (US$ 357.9 million) with 1.0 million premature deaths annually.[31] Thus, the average per person loss of productivity due to premature deaths would be RMB 2,935 (US$ 357.9) measured at the year 2000 value. With 1.025 million lives saved, productivity would be RMB 3 billion (US$ 0.36 billion) at a price elasticity of −0.15. When the price elasticity is increased to −0.50, the amount of lives saved would be 3.42 million (with an additional tax of RMB 1 per pack), and RMB 9.92 billion (US$ 1.2 billion) would be generated for the Chinese economy.

In sum, these simulation estimates indicate that a cigarette tax increase in China would reduce cigarette consumption through increased numbers of people quitting smoking, not initiating smoking, and/or cutting back on their consumption. The high price of cigarettes will especially deter the younger generation from starting to smoke.[31] Therefore, a tax increase on cigarettes would save lives, reduce medical care costs, increase productivity, and increase government revenue in China.

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V. Role of Tobacco Tax and Its Impact on the Cigarette Industry

Role of Government in Cigarette Manufacturing

The Chinese government plays an important role in the production of both tobacco leaf and cigarettes through its national monopoly, the State Tobacco Monopoly Administration (STMA) and the China National Tobacco Company (CNTC). In 1983, CNTC and STMA were established to control the production of tobacco leaf and the manufacturing and marketing of cigarettes for the entire country.

STMA is a government agency that sets overall policies for tobacco production and cigarette manufacturing. It then delegates to CNTC full authority to:

- decide on the allocation of tobacco production quotas for each province,
- procure tobacco leaf,
- transport and store tobacco leaf, and
- manufacture and sell cigarettes.

STMA sets overall government policy on tobacco, beginning with the allocation of tobacco production quotas among the provinces, the pricing of tobacco leaf, the setting of production quotas for cigarettes, and the managing of international trade. With the establishment of STMA, the policy, data collection, and research functions with respect to tobacco production were removed from the jurisdiction of the Ministry of Agriculture. The National Development and Reform Commission (NRDC) under the State Council has the jurisdiction to monitor CNTC and set the overall operation policy for the tobacco industry.

In 2005, China's state-owned tobacco monopoly produced 1.7 trillion cigarettes, generating a profit and tax of RMB 240 billion, about 7.6 percent of central government revenue.[18] The cigarette manufacturing industry employed about a half million people, or about 0.06 percent of the total national employment. About 3.5 million persons were engaged in retail cigarette sales. However, very few of them are sole cigarette retailers, and many work on a part-time basis; they comprise 0.6 percent of the total employed population.[18]

Even though CNTC is a monopoly, it has numerous company branches throughout the provinces that vary in size and act as competitors. The regional CNTC branches develop sales plans, set factory production orders and prices, and are subsequently responsible for distribution. Each branch company is decentralized in that it must be self-sufficient and is allowed to retain the balance of its profits above and beyond the required amount of profit/tax submitted to the central government. Since local governments benefit from tobacco production through taxes and employment, 24 out of 31 provinces and 4 municipalities (Shanghai, Beijing, Tianjin, and Chongqing) have cigarette companies. The top five cigarette manufacturing provinces in 2000 were Yunnan, Henan, Shandong, Hunan, and Hubei.[33] The central government, especially CNTC, is reluctant to raise the cigarette tax because of concerns about employment and a possible decline in tax revenue in the long run. Actually, since the local government shares the cigarette tax revenue with the central government, even the unprofitable tobacco companies continue to exist because local government is willing to subsidize them for the sake of employment and the tax revenue generated from their local companies.

China has five classes of cigarettes, from class 1 (the most expensive brand) to class 5 (the least expensive), as shown in Table 5.1. These classes are categorized according to the wholesale price per carton. The wholesale price of class 1 cigarettes is RMB

Table 5.1: Cigarette Production by Class in China in Billions of Cigarettes (1999–2004)
(% of total cigarettes)

Production by Cigarette Class in China	1999	2000	2001	2002	2003	2004
Class 1 (RMB 50 and above)[a]	176.7 (11%)	196.6 (12%)	234.0 (14%)	111.3 (6%)	128.3 (7%)	152.5 (8%)
Class 2 (RMB 30–49)[a]	326.1 (20%)	335.9 (20%)	350.1 (21%)	173.6 (10%)	203.7 (11%)	260.9 (14%)
Class 3 (RMB 16–29)[a]	486.1 (30%)	468.6 (28%)	501.5 (30%)	580.8 (34%)	648.9 (36%)	754.2 (40%)
Class 4 (RMB 11–15)[a]	587.5 (36%)	616.9 (37%)	551.0 (33%)	565.7 (33%)	600.1 (34%)	575.8 (31%)
Class 5 (RMB 10 and below)[a]	67.4 (4%)	50.0 (3%)	33.4 (2%)	291.0 (17%)	209.3 (12%)	130.8 (7%)
Total	**1643.8**	**1668.0**	**1670.8**	**1722.4**	**1790.3**	**1874.2**

Source:
China State Tobacco Monopoly Administration. China Tobacco Statistics Yearbook, 2000–2005. Beijing, China.
Note:
[a] *Wholesale price per carton.*

50 per carton and above; class 5 cigarettes cost RMB 10 or less per carton. Classes 2 to 4 constitute more than 70 percent of the total supply of cigarettes. Classes 1 and 5 have the lowest share, which fluctuated between 1999 and 2004.[33] Top-price brands (class 1) such as Panda or Zhonghua (China) are often bought by high-income smokers or as gifts for important social events. The middle range (classes 2, 3, and 4) consists of foreign brands (such as Marlboro or 555) or domestic brands such as Hong-Ta-Shan (Red Pagoda). Class 5 brands, mostly local ones with less attractive packaging, are purchased by low-income smokers.

The World Trade organization (WTO) and the Tobacco Industry

China entered the WTO in 2001. As a member, China had to agree to (1) reduce the tobacco leaf import tariff, (2) reduce the cigarette tariff, (3) eliminate the export rebate for flue-cured tobacco leaf and cigarettes, and (4) eliminate the export bounty, a reward for exporting cigarettes. All these agreements have made foreign cigarettes more competitive in the Chinese market and China's tobacco leaf less competitive in the world market.

Even with the WTO removing China's longstanding restrictions on tobacco imports and the numerous domestic companies within the state monopoly, the largest Chinese tobacco company cannot yet directly compete with the transnational tobacco companies. From 1995–2000, total official imported cigarettes comprised only 0.8 percent of the domestic market. By early 2000, foreign imported products represented about 3 percent of the Chinese market. CNTC anticipates that before the end of the decade, foreign products may reach 8 to 10 percent of the Chinese tobacco market.[33]

Since China entered the WTO, the tariff on tobacco leaf has gradually been reduced from 64 percent in 1999 to 25 percent in 2003 to 10 percent in 2004. This tariff

reduction has made foreign tobacco leaf as competitive as Chinese domestic tobacco leaf. The tariff on cigarette products dropped from 49 percent in 2001 to 25 percent in 2003. Although imported cigarettes comprised only 3 percent of the total market share in China in 2002, China's cigarette imports increased by 37 percent, from 68.51 million packs in 2002 to 93.92 million packs in 2003.[33] Before 2003, foreign brands, such as Marlboro or 555, cost about RMB 20 (US$ 2.50) per pack. The current market price is now RMB 12 (US$ 1.50) per pack, similar to popular domestic brands such as Hong-Ta-Shan, which cost about RMB 10. As the Chinese economy is growing and personal incomes are rising, the demand for foreign brands is increasing, particularly among urban young adult male and female smokers.[34] Special retail permits for foreign tobacco products formerly were issued by CNTC to control foreign cigarette retail sales. Since 2003, with the elimination of this special retail permit under the WTO agreement, any retailer who has a CNTC general retail permit to sell domestic cigarettes can sell foreign cigarettes.

Chinese tobacco companies also have been concentrating on profits from high-priced cigarettes. In 2002, sales of cigarettes priced higher than RMB 100/carton reached 570,000 cases, accounting for only 1.7 percent of the total sales but generating 31.8 percent of the total profits of the cigarette industry. By early 2003, among the 36 designated popular brands and other high-priced cigarettes, sales of 8 of the brands had decreased, 6 of them by more than 10 percent.[34] The CNTC-affiliated tobacco companies have been reluctant to produce low-priced cigarettes that yield low profits. Jiang Chenkang, the president of CNTC, recently announced that CNTC would subsidize low-priced cigarette producers to increase the supply for low-income smokers.[35] From the public health perspective, this is not a healthy policy initiative because it will have a negative health impact on the low-income population.

Given the numerous manufacturing companies and brands throughout the regions, CNTC lacks the economy of scale necessary to compete effectively with the transnational companies' products. Judging from historical evidence, China will lose market share to multinationals as its market opens. Thus, a higher tax rate will be a good way to maintain the revenue stream from tobacco as domestic production falls.

Under the WTO agreement, to compete with foreign companies STMA has tried to achieve economic efficiency in cigarette production, pricing, and marketing by closing inefficient and small cigarette factories. While maintaining the quota system, STMA has sought to achieve economy of scale by ultimately reducing its operations to 30 to 50 factories with 6 to 8 large inter-regional tobacco groups. The CNTC seeks to establish mergers within provinces first and then have regional companies compete against one another. In response to WTO, CNTC has engaged in major market restructuring by first merging within a region and then across regions. The number of cigarette companies decreased drastically from 185 in 2000 to 44 in 2005, and the number of cigarette brands decreased from 1,049 in 2001 to 325 in 2005.[33]

One major consequence of merging is unemployment. The 92 small cigarette companies that were closed maintained about 59,000 working employees and 5,500 retired ones. For the closure, the State Council provided a 2 billion RMB fund for lump-sum payments to those employees and also provided retraining or re-appointment within other tobacco companies.[33] The closed companies also used the proceeds from the sale of their fixed assets as a settlement allowance. Thus, in recent years, Chinese tobacco companies have begun taking steps to address employment issues as the tobacco industry has restructured.

Smuggling and Counterfeiting

Cigarette smuggling and counterfeiting are important concerns in China: STMA estimates that in 2002, 100 billion cigarettes were either smuggled or counterfeit.[34] By the late 1990s, up to 50 billion smuggled cigarettes were believed to be foreign brands; the top smuggled brands were 555 (British American Tobacco), Marlboro (Philip Morris), and Hilton (British American Tobacco).[36] This increased market presence from smuggling may have affected Chinese recognition of these brands. In a survey of 2000 Chinese university students, these three foreign brands were among the eight most recognized brands.[37]

In 2003, 46 percent of smuggled brands were Chinese products.[33] Domestic smuggling is even more profitable because of costs and the taste preferences of Chinese smokers. Exported domestic cigarettes are exempted from taxes, and smugglers can obtain these cigarettes at prices nearly 50 percent lower than on the domestic market. State taxes (e.g., value-added tax [VAT], specific excise, and *ad valorem* tax) can be evaded. Other taxes for state certification and high-rate custom tariffs can be avoided if cigarettes are smuggled through irregular channels. An example is Zhonghua (China) cigarettes, which have a factory price for external sale of RMB 2,100 per case and a factory price for domestic sale of RMB 2,500 per case.[33] When the 17 percent VAT and 40 percent consumption tax are added, the after-tax factory price for external sale is RMB 3,297 per case, and the retail price on the domestic market is RMB 15,000 per case. The difference between the factory price for external sale and domestic sale is RMB 12,803 per case. Smuggling domestic cigarettes can result in large profits.

From 1994–1998, the STMA, the General Administration of Customs, the Ministry of Public Security, and the State Administration for Industry and Commerce launched a special anti-contraband effort. In recent years, the Chinese government has taken further steps to reduce smuggling by strengthening the customs department and increasing smuggling penalties in an effort to recoup the estimated RMB 14.8 billion (US$ 1.8 billion) in annual lost tax revenue.[34] The number of smuggled cigarettes seized declined from 3.87 billion cigarettes in 2004 to 1.27 billion in 2005.

Counterfeiting of cigarettes is rampant and profitable in China. In 1999, around 2 million cartons of counterfeit cigarettes, both domestic and international brands, were sold in China, double the number sold in 1997. In 2003, the government confiscated 5.3 billion cigarettes, 0.3 percent of the estimated total national output of 1,789 billion cigarettes.[33] A 2005 national survey conducted by the China National Bureau of Statistics, on behalf of the CNTC, found that about 10 percent of cigarettes on the market are counterfeit.[32] Both the Chinese cigarette industry and foreign producers have serious concerns about counterfeit cigarettes. In recent years, STMA has taken steps to reduce the counterfeiting of cigarettes by instituting strong jail sentences and economic penalties.

Simulation of Impact of Cigarette Tax Increases on Cigarette Manufacturing, Employment, and Income

An increase in cigarette taxes will reduce cigarette consumption. It is important to estimate these effects so that government policymakers can be better informed when making decisions concerning cigarette taxes. When an additional tax is levied on cigarettes, the immediate impact is a reduction in sales, which will lead to a reduction in revenue as well as employment in the cigarette industry. Overall, the cigarette manufacturing industry employs about 500,000 people. If we use the example of a 1 RMB specific excise tax increase, as shown in Table 4.2, under a price

elasticity of –0.15 the reduction in sales would be 3.1 billion packs. The average wholesale cigarette price was RMB 2.71 (as shown in Table 4.2); thus, the total sales revenue loss would be RMB 8.4 billion, as shown in Table 5.2. Excluding the production costs and tax contribution to the government (which represents about 44 percent of total revenue), the industry net loss would be RMB 4.72 billion, only 0.55 percent of the total revenue.[18] The average profit of the cigarette manufacturing industry is 10.3 percent of total revenue.[18] Therefore, the loss of profit would be RMB 486 million. Compared to the gain in government revenue of RMB 85.4 billion, the net loss to the cigarette industry is negligible.

Under the assumption of price elasticity at –0.50 with an increase of RMB 1 per pack, the reduction in cigarette sales would be 10.4 billion packs. The average wholesale cigarette price was RMB 2.71; thus, the total gross sales revenue loss would be RMB 28.1 billion, as shown in Table 5.2. The net industry loss would be RMB 15.8 billion, and the net profit loss would be RMB 1.63 billion — still less than 2 percent of the increase in government revenues.

If we consider employment a linear function of production volume, then with a 1.6 percent loss of sales in the cigarette industry under a price elasticity of –0.15, as shown in Table 5.2, employment rates would drop by the same percentage, representing about 1,656

Table 5.2: Simulation of Impact of Tax Increase per Pack of Cigarettes on the Cigarette Manufacturing Industry in China

	Increases in Specific Excise Tax[a]			
	1 RMB	**2 RMB**	**3 RMB**	**4 RMB**
Reduction in Cigarette Consumption (billion packs)				
–0.15[a]	3.1	6.2	9.3	12.4
–0.50[a]	10.4	20.8	31.2	41.6
Total Sales Revenue Loss (billion RMB)[b]				
–0.15	8.4	16.8	25.2	33.6
–0.50	28.1	56.2	84.3	134.4
Industry Net Revenue Loss (billion RMB)				
–0.15	4.7	9.4	14.2	18.9
–0.50	15.8	31.6	47.4	63.2
Net Government Tax Revenue Gain (billion RMB)[c]				
–0.15	80.7	155.1	223.2	285.0
–0.50	49.1	77.4	84.8	71.4
Industry Employment loss (number of employees)				
–0.15	1,656	3,312	4,968	6,624
–0.50	5,549	11,098	16,647	22,460

Notes:

[a] *Price elasticity*

[b] *Total sales revenue loss is the product of RMB 2.71 per pack multiplied by the reduction in consumption.*

[c] *Net government tax revenue gain is calculated by subtracting industry net revenue loss from additional tax revenues gained from specific excise tax increase shown on Table 4.2.*

... the amount of employment loss from an increase in taxes is minimal.

employees. Under a price elasticity of –0.50, with a 5.3 percent loss of sales, the employment loss would be approximately 5,549 employees. This number probably represents the maximum number of job losses, based on the average linear production relationship. In most cases, the attrition rate would be lower because of early retirement and job transfers. Compared to the loss of 59,000 employees due to company merging, the amount of employment loss from an increase in taxes is minimal.

Table 5.2 also provides the simulation results of the impact of an increase in the specific excise tax of RMB 1 up to RMB 4 per pack under a price elasticity of –0.15 and –0.50, respectively. The higher tax rate has had a larger impact on the cigarette industry. The China National Tobacco Company is in the process of eliminating inefficient factories and consolidating production. The increase in tax and reduction in cigarette consumption may provide further impetus to improve the efficiency of cigarette production. The effect of the reduction in cigarette consumption could lead the cigarette manufacturing industry to diversify into other products. Furthermore, the amount of money that smokers save from reduced cigarette consumption could be spent on food or household goods. Therefore, the net effect on employment could be even smaller than estimated. Studies in the United States[38], United Kingdom[39], and Indonesia[40] using their national input-output industry tables showed that a cigarette tax increase had led to a gain in income and employment in other sectors.

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VI. Role of Tobacco Tax and Its Impact on Tobacco Farming

Role of Government in Tobacco Leaf Production

The Chinese National Tobacco Company (CNTC) has the overall responsibility to set national tobacco leaf production quotas for all provinces. The procurement of tobacco leaf is one of CNTC's monopolistic functions. Private agencies or individuals are not allowed to purchase tobacco leaf or manufacture cigarettes without CNTC's approval. Retailers also require CNTC's permission to sell cigarettes. Basically, CNTC controls the sources of production material (tobacco leaf), the allocation of production quotas, and the marketing channels. It is illegal for farmers in China to sell tobacco leaf to private producers. Moreover, private manufacturing of cigarettes is illegal in China. Although the private sector is not allowed to manufacture cigarettes, the government is limited in its ability to fully enforce these regulations. Underground trade of tobacco leaf and cigarette manufacturing still exists in China.

To help ensure that the expected production quota is met, CNTC (or its affiliated companies) signs contracts with tobacco farmers specifying the amount of acreage that should be under tobacco cultivation and the price it will pay for different grades of leaf. CNTC is obligated to purchase the amount of tobacco leaf produced under the allocated acreage at a predetermined price, and CNTC is the only legal buyer. One of STMA's key policy interventions to control tobacco production is to set prices. These prices are set according to the production location and quality. Each October, the STMA announces a list of 200 prices covering five production regions and four grading categories; each quality category includes more than 10 detailed purchase prices. Price varies widely among the five tobacco leaf-growing regions and among the four grading categories. Yunnan belongs to Region 1, and northern Chinese provinces belong to Region 5. The difference in the top-grade tobacco leaf purchase price between Yunnan Region 1 and northern provinces Region 5 could be 25 percent, and the price for top-grade leaf could be 50 times higher than for bottom-grade within the same region.[41] Recently, the government raised the procurement price of top-grade tobacco leaf and decreased the procurement prices of the lowest grades. This action was a strong signal that the government wanted to discourage the production of low-grade tobacco leaf.

Recently, the government raised the procurement price of top-grade tobacco leaf and decreased the procurement prices of the lowest grades. ... a strong signal that the government wanted to discourage the production of low-grade tobacco leaf.

One difficulty with using the price schedule to purchase tobacco leaf from farmers is the lack of a scientific benchmark for grading, which often leads to disputes between tobacco farmers and agents. In recent years, CNTC has tried to have a third party mediate price disputes by inviting tobacco farmers in the community to join a pricing committee.

According to law, CNTC is the only legitimate buyer of tobacco leaf. As a purchaser, CNTC withholds 20 percent of its purchase price as the tobacco leaf tax and submits the amount to the local government as local government tax revenue. While the Chinese central government considers the imposition of tobacco leaf tax as one way to control tobacco supply and provide financial assistance to the local

government, in actuality the tobacco leaf tax acts as an incentive to encourage village/township officials to plant tobacco leaf above and beyond the CNTC quota. Therefore, farmers need to sell their leftover leaf to underground private cigarette companies, either for private local brands or for counterfeit brands. Counterfeit cigarettes are a serious challenge for CNTC as well as for the foreign brands because they undermine the market shares of both CNTC and the foreign companies. In fact, counterfeit cigarettes are an even greater challenge than smuggled foreign cigarettes. In 2000, the government confiscated 570,000 cases of counterfeit cigarettes.[33]

Tobacco Farming Production, Employment, and Income

In 2005, China produced 2.435 million tons of tobacco leaf, about one third of the world's production.[20] In the same year, the 1.363 million hectares planted with tobacco accounted for less than 1 percent of China's total agricultural cultivated land. The gross value of flue-cured tobacco was RMB 23.23 billion, or RMB 9.54 per Kg, contributing 1 to 2 percent of the Chinese agricultural economy.

The production of tobacco leaf is a source of tax revenue for local government; 24 of the 31 provinces in mainland China grow tobacco. China has about 5 million farm households engaged in growing tobacco, representing about 2 percent of all farmers.[42] Almost all farm households that grow tobacco also produce other crops. Of the 24 tobacco-producing provinces, Yunnan, Guizhou, Henan, and Sichuan are the four most important in terms of both growing tobacco and manufacturing cigarettes. Together, these four provinces produce about 51 percent of China's total tobacco leaf product, as shown in Table 6.1. According to the 2005 China Agricultural Statistics, among those top four provinces, tobacco leaf's net return compared to its production cost was 22 percent for Yunnan and 18 percent for Henan, but only 1.3 percent for Guizhou and a negative return of –5.0 percent for Sichuan,[43] as shown in Table 6.2.

In spite of the alleged importance of tobacco leaf production to farmers, very little empirical research is publicly available on farmers' costs and return for producing tobacco leaf. Surveys on the economic return on tobacco leaf production compared to other crops planted by tobacco farmers were conducted in 2002 and 2004 by the research team funded by the U.S. National Institutes of Health Fogarty International Center.[41] Table 6.3 provides a summary of total costs and revenue for each major crop by farm size taken from a survey of 1,003 farming households in Sichuan

Table 6.1: Tobacco Leaf Production Plantation Area and Revenue for National and Four Major Provinces, 2004

	Tobacco Leaf Production (million tons)	Tobacco Land (million hectares)	Tobacco Leaf Value (billion RMB)
National	2.435	1.363	23.230
Yunnan	0.690	0.354	7.554
Guizhou	0.300	0.188	2.726
Henan	0.255	0.129	2.320
Sichuan	0.094	0.046	0.750

Source:
China Statistical Yearbook, 2005.

Table 6.2: Tobacco Leaf Cost and Revenue (in RMB) in 18 Provinces of China, 2004

Province	Total Value of tobacco leaf	Production Cost	Net Profit	Cash Cost	Cash Revenue	Cost-profit ratio (%)
Jilin	1307.5	694.0	482.1	560.1	747.4	58.4
Hunan	1837.2	1281.3	500.5	674.9	1162.3	37.5
Fujian	1523.3	1060.4	406.6	614.3	909.0	36.4
Heilongjiang	1079.3	668.2	264.8	505.9	573.4	32.5
Jiangxi	1448.5	1100.4	315.3	526.5	922.0	27.8
Liaoning	1201.1	854.8	256.2	539.3	661.8	27.1
Guangdong	1596.5	1164.9	325.1	524.5	1072.0	25.6
Chongqing	1088.4	858.3	206.4	408.9	679.5	23.4
Yunnan	1436.8	1080.1	260.8	465.9	970.9	22.2
Anhui	1138.6	898.2	204.6	420.8	717.8	21.9
Henan	1056.0	845.4	164.0	355.3	700.7	18.4
National average	**1259.4**	**1000.0**	**187.4**	**485.8**	**773.7**	**17.5**
Gansu	1101.0	831.1	125.8	365.6	735.4	12.9
Hubei	1055.3	883.4	118.1	508.0	547.3	12.6
Shan'xi	835.5	753.2	39.6	307.8	527.7	5.0
Guangxi	1270.3	1142.3	17.9	642.1	628.2	1.4
Guizhou	1096.8	1039.0	13.5	503.7	593.0	1.3
Sichuan	878.7	839.4	–46.1	469.9	408.8	–5.0
Shandong	893.2	1058.5	–276.3	616.4	276.3	–23.6

Source:
Price Department of NDRC. Information Collection of National Farm Produce's Cost and Profit, 2005. China Statistics Press.

Table 6.3: Revenue-to-Cost Ratios by Major Crops by Size of Farm in Sichuan and Guizhou Provinces, 2002

	Small (≤ 0.5 hectare) (n=302)	Medium (0.5–1.0 hectare) (n=361)	Large (> 1.0 hectare) (n=340)	Total Sample (n=1003)
Grain	2.5	2.3	2.6	2.5
Tobacco	2.4	2.6	2.8	2.6
Beans	3.0	5.9	2.9	4.3
Oil seed	3.1	4.0	3.7	3.7
Fruit	4.7	3.4	3.7	3.7

Source:
Hu TW, Mao Z, Jiang H, et al. The role of government in tobacco leaf production in China: National and local intervention. Int J Pub Policy. 2007;2:235–248.
*Note: *1 mou = 1/15 hectare.*

...the 2004 survey in Yunnan Province indicated that tobacco leaf had the lowest revenue-to-cost ratio per mou (a standard unit of land measurement in China, equivalent to 1/15 of a hectare), 0.99. The highest revenue-to-cost ratio was for mulberry and silkworm, 4.00; followed by fruit, 2.00; vegetable oil, 1.70; and rice and wheat, 1.00.

and Guizhou provinces in 2002. Comparing the ratio of the revenue to the costs of each crop, grain production and tobacco had lower returns than vegetable oil, beans, or fruit. According to these ratios, for every RMB farmers spent, they received on average RMB 3.7 (US$ 0.45) for fruit. Small farmers benefited even more, receiving RMB 4.7 (US$ 0.57) per RMB spent for fruit. On the other hand, for every RMB farmers spent on tobacco production, they received only RMB 2.4–2.8 (US$ 0.29–0.34), a smaller return than from other crops, including beans and vegetable oil.

Similarly, results of the 2004 survey in Yunnan Province indicated that tobacco leaf had the lowest revenue-to-cost ratio per mou (a standard unit of land measurement in China, equivalent to 1/15 of a hectare), 0.99. The highest revenue-to-cost ratio was for mulberry and silkworm, 4.00; followed by fruit, 2.00; vegetable oil, 1.70; and rice and wheat, 1.00.

The finding that tobacco may not always produce the best economic return is not unique to China. A study from India reported the following revenue-to-cost ratios: 4.01 for safflower, 1.33 for mustard, and 1.2 for flue-cured tobacco leaf.[44] Tobacco farming is often labor-intensive and requires equipment to cure the leaf, which reduces the net return of land. Therefore, alternative crops sometimes yield greater revenue-to-cost ratios than tobacco leaf cultivation does.

The aforementioned 2004 survey in Yunnan Province asked what options tobacco farmers would have if they discontinued or reduced tobacco leaf farming. About 93 percent of tobacco farmers would choose to plant other crops, mainly corn, potatoes, and cotton. To make the switch, farmers would most like to receive good crop seeds and marketing channels.

As indicated by STMA, the relatively low return from tobacco leaf production could be the result of an oversupply of tobacco leaf on the market, which could be reflected by the government's relatively low purchase price. If production of tobacco leaf does not provide a better economic return than other crops, why do farmers continue to plant it? One reason is that the local governments collect local tax revenues from tobacco leaf by encouraging local farmers to produce above and beyond the CNTC quota. Second, the ongoing agreement with CNTC assures farmers of revenue from tobacco leaf without having to worry about storage or marketing problems. Under the agreement, CNTC provides seed selection, fertilizer, loans, technical assistance, and guaranteed purchase. Third, the soil and weather in some regions are ideal for tobacco plantations. Finally, some farmers may not be aware of the alternative crop options.

In the Yunnan province survey, some tobacco farmers indicated that the local government insists that they produce tobacco leaf, often against their will. A strategy to reduce or eliminate the special tobacco leaf tax would reduce the financial incentive for local government to promote tobacco leaf production, instead allowing farmers to decide what crops to grow. A farmer's preferred crop may be more in his interests than a crop the local government stipulates. The loss of potential local government revenue could be compensated for by an increase in the cigarette tax at the central government level. In turn, a portion of the extra revenue from the cigarette tax could be transferred to the local government, a practice common to many central government tax revenue

plans. In fact, this type of intergovernmental revenue transfer mechanism existed when the central government eliminated the tax on other agricultural crops in 2006.

This is a prime time for the Chinese government to encourage less profitable tobacco farmers to produce other crops. The Chinese Ministry of Agriculture should collaborate with STMA to provide technical assistance and economic incentives to aid the transition from tobacco leaf production to other crops. The results of this study indicate that tobacco leaf production is not a way for farmers to escape poverty or become wealthier.

Simulation of Impact of Tobacco Tax Increases on Tobacco Farming

One of the major concerns of the Chinese government with respect to raising the tobacco tax is its potential negative economic impact on tobacco farmers' livelihood. To estimate the possible economic impact of a tobacco tax increase on tobacco farming, one can first examine the demand and supply relationship between a reduction in the demand for cigarettes and the magnitude of a cigarette price increase (i.e., due to a tax increase). Given the predicted amount of the reduction in the demand for cigarettes, one can use a simple linear production relationship between the input requirement (tobacco leaf) and a produced pack of cigarettes. One can further simulate the monetary value lost from not producing tobacco leaf by multiplying the average government purchase price by the amount of tobacco leaf not sold in the market.

According to the estimated demand relationship provided in Table 4.2, a 1 RMB increase in the specific excise tax per pack would reduce demand by 3.1 billion packs when the price elasticity is −0.15. The Chinese tobacco industry statistics indicate that 0.041 ton of tobacco leaf is required to produce one case (or 50,000 pieces) of cigarettes.[45] Thus, a 1 RMB tax increase would lead to a reduction in the need for 26,053 tons of tobacco leaf, as shown in Table 6.4.

The productivity relationship between tobacco leaf and hectares is 1.81 tons per hectare.[45] Therefore, a 1 RMB tax increase would reduce land use for tobacco farming by about 14,392 hectares, about 2 percent of total tobacco cultivation land use. The reduction in tobacco leaf sales would diminish tobacco farmers' incomes. The government purchase price for the middle-grade tobacco leaf among the four regions ranged from RMB 755 per 50 kg for tobacco leaf from Yunnan and Guizhou provinces to RMB 500 for leaf from Northern Chinese provinces.[41] A 500 RMB price was picked for the analysis so that this purchase price could also be used to simulate the tax impact at the national level. The estimated revenue loss to farmers would be RMB 261 million from a 1 RMB per pack tax increase. Compared to the total national value of tobacco leaf sales, these respective amounts of revenue loss would be about 2.0 percent of total tobacco revenue, a very small reduction. Considering the cost of producing tobacco leaf, the reduction in local government revenue would be RMB 51.85 million nationally. In 2005, the local governments in China collected RMB 4.646 billion in local tax; the reduction of RMB 51.85 million represents 0.30 percent of total revenue loss. These losses could be replenished by the gain of RMB 85.4 billion in tax revenue by the central government. In essence, an additional 1 RMB tax increase on cigarettes would not have a serious effect on either tobacco farmers' incomes or local government tax revenue. In fact, the alternative use of this tobacco land could be even more beneficial, based on farm household survey results on costs and returns on tobacco leaf production.[41]

As shown in Table 6.4, under the assumption of a price elasticity of −0.50, a similar simulation can be estimated for an additional 1 RMB specific excise tax

Table 6.4: Simulation of Impact of Tax Increase per Pack of Cigarettes on Tobacco Farming in China

	Increases in Specific Excise Tax			
	1 RMB	2 RMB	3 RMB	4 RMB
Reduction in Cigarette Consumption (billion packs)[a]				
–0.15*	3.1	6.2	9.3	12.4
–0.5*	10.4	20.8	31.2	41.6
Reduction in Tobacco Leaf (in tons)[b]				
–0.15	26,053	52,106	78,159	104,212
–0.5	87,296	174,592	261,888	349,184
Reduction in Land Use (in hectares)[c]				
–0.15	14,392	28,784	43,176	57,568
–0.5	48,225	96,450	144,675	192,900
Reduction in Farmers' Revenue (in million RMB)[d]				
–0.15	261	522	783	1,044
–0.5	873	1,746	2,619	3,492
Reduction in Local Government Tax (in million RMB)[e]				
–0.15	52	103	153	207
–0.5	174	349	523	698

Notes:
** Price elasticities.*
[a] Figures obtained from Table 4.2.
[b] 0.041 tons of tobacco leaf produce one case of cigarettes (50,000 cigarettes).[6]
[c] Average productivity is 1.81 tons per hectare.
[d] Average government purchase price was RMB 500 per 50 kg, RMB 10,000 per ton (1 ton = 1000 kg).
[e] 20% Special Tobacco Leaf Tax.

increase per pack of cigarettes. Table 6.4 shows that with a 10.4 billion pack reduction in cigarette consumption, the demand for tobacco leaf would be reduced by 87,296 tons, and about 48,225 hectares of land would not be used for tobacco leaf production. As a result, tobacco farmers would lose 6 percent of their total revenue, representing RMB 873 million. The local governments could lose RMB 174.53 million. Again, farmers would use the land to produce other profitable crops, so their actual revenue change would be a maximized and some could even increase earnings. The central government would generate an additional RMB 64.9 billion, 372 times the loss of local government revenue. These local government revenue losses could be easily compensated for by the financial gain of the central government.

Overall, these simulation results demonstrate that raising the cigarette tax at the consumption level would have a minimal negative economic effect on tobacco farmers.

Table 6.4 also provides the simulation results of the impact of an additional 2 RMB, 3 RMB, and 4 RMB specific excise tax using a price elasticity of –0.15 and

−0.50, respectively. The higher tax rate shows a larger impact on tobacco farming. Overall, these simulation results demonstrate that raising the cigarette tax at the consumption level would have a minimal negative economic effect on tobacco farmers. The central government's financial gains could easily offset the losses to tobacco farmers and local government revenue, and the land no longer used for tobacco leaf cultivation could be dedicated to raising other crops.

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VII. Implementation of Tobacco Tax Reform

Government Organization for Tobacco Tax Reform

The current Chinese tobacco tax system, which includes a value-added tax and a consumption tax, has been in existence since 1994. By current law, one of the functions of the Ministry of Finance (MOF) and the State Administration of Taxation (SAT) is to design, propose, and implement changes in the existing tax law. Once a recommendation is approved by the State Council, the SAT and its corresponding provincial and local agencies can then collect the tax revenue according to the new tax rate.

Tax Base

As noted in Chapter III, a value-added tax and an enterprise income tax are general taxes applicable to all sectors of the economy, and the central government sets a uniform tax rate, 17 percent, for all sectors. China has a special specific excise tax on 11 commodities including cigarettes, and the tax rate varies according to the specific commodity. Thus, it would be logical to adjust the tobacco tax rate through the cigarette-specific tax. Currently, the cigarette tax is collected at the producer level when cigarettes are sold from a producer to a wholesaler. Thus, an additional specific excise tax at the producer level would be administratively efficient and effective.

Specific Excise Tax Versus *ad valorem* Tax

As noted in Chapter III, the Chinese government collects a fixed amount of RMB 150 per case (50,000 cigarettes or 2500 packs or RMB 0.06 per pack) as a specific excise tax, and then assesses two different tax rates as an *ad valorem* tax (45 percent on the wholesale price for those cigarettes costing RMB 50 or more, and 30 percent for those costing less than RMB 50) per carton. Thus, tax on cigarettes in China is a combination of a very small specific excise tax and a larger *ad valorem* tax. A specific excise tax is a fixed tax based on quantity, regardless of the price of cigarettes. As such, it is an administratively efficient system for collecting tax revenue. A specific excise tax can be used to reduce tax incidence transfer and smuggling and counterfeiting. One drawback of the specific excise tax is that it needs to be adjusted by overall inflation or personal disposable income over time. To take into account these factors, it is very important to build in an automatic adjustment for inflation, and ideally adjust it to address increased consumer purchasing power as well. If the purpose is to discourage smoking and improve health, a high specific excise tax is a good way to keep very low-priced cigarettes off the market, even for low-income smokers. On the other hand, high-income smokers would experience less of a financial impact. In contrast, a tax that is a percentage of price — an *ad valorem* tax — means that low-income smokers pay a relatively lower amount of tax than high-income smokers, as wealthier smokers tend to buy more expensive cigarettes. The *ad valorem* tax tends to keep low-priced cigarettes on the market. Thus, from a health standpoint, a higher specific excise tax would be particularly useful.

One drawback of the specific excise tax is that it needs to be adjusted by overall inflation or personal disposable income overtime. To take into account these factors, it is very important to build in an automatic adjustment for inflation, and ideally adjust it to address increased consumer purchasing power as well.

Barriers and Opportunities Related to Implementing an Additional Cigarette Tax

There are two types of barriers to implementing an additional cigarette tax: (1) the economic interests of the tobacco industry, and (2) the economic interests of the local government.

Economic interests of the tobacco industry

As noted, China has a state-owned monopoly tobacco company. In fact, the central government receives both the company's profit and tax as a combined source of revenue. Part of this revenue/profit currently is retained by the producers; thus, increasing the cigarette tax could cut into producers' retained profit. If an additional tax is imposed, the tobacco company should be encouraged to pass the tax burden to the consumer to achieve maximum health benefits outlined in Table 4.2.

Economic interests of the local government

The local government in China receives revenue from two types of tobacco tax: (1) 100 percent of the tobacco leaf tax, and (2) 25 percent of the value-added tax. It has been argued that the tobacco leaf tax is used for economic development at the local level, particularly for counties in poverty (185 of 510 tobacco leaf counties in China are classified as counties in poverty). Thus, eliminating the tobacco leaf tax could have significant financial repercussions for those counties. The tobacco industry generates not only employment at the local level, but also related enterprise income tax, reconstruction and development tax, and educational supplemental tax. However, since the specific excise tax and *ad valorem* tax revenue belongs to the central government, an increase in the specific excise tax rate would produce additional revenue that the central government could use to compensate the local government for the loss of revenue from tobacco leaf tax. This revenue-sharing of the consumption tax between the central government and local government would require the design of an intergovernmental revenue-transfer scheme. However, the intergovernmental revenue-transfer scheme developed in connection with the 2006 abolishment of the agricultural tax could be applied to the elimination of the tobacco leaf tax.

The current revenue sharing of 25 percent of the value-added tax from cigarette products to the local government serves as an incentive for local government to promote cigarette manufacturing. The scheme of revenue sharing has led the local government to protect its own interest in cigarette production at the local level. This has led to the formation of a local monopoly for cigarette production, which violates the overall national tobacco producing goal-setting capacity. Thus, it is crucial to re-examine the impact of the revenue-sharing scheme on the cigarette industry with respect to the current value-added tax as well as the tax rate of the cigarette consumption tax. In fact, the Division of Financial Management of STMA recognized this issue in 2004.[46]

Re-adjustment of the Cigarette Tax Rate

Since the overall effective cigarette tax rate in China measured at the retail level is around 40 percent, there is room to increase the tax rate to make it more comparable to the cigarette tax rate in other places: Hong Kong, China (60 percent), Philippines (63 percent), Korea (60 percent), Singapore (69 percent), and Thailand (63 percent). As noted in Chapter III, the median range of international tax rates is between 65 percent and 70 percent.

Given the current cigarette tax system in China, raising the specific excise tax seems the most convenient option administratively.

Given the current cigarette tax system in China, raising the specific excise tax seems the most convenient option administratively. One could argue that specific excise taxes may impose a higher tax burden on low-income smokers. However, low-income smokers are more price responsive than high-income smokers. The money saved by reduced cigarette consumption would be particularly useful for those low-income smoker households to spend on other household items, such as education, housing, and food.[13] Furthermore, the government could allocate the extra tax revenue to assist low-income consumers with their health care expenses.

The current specific excise tax is very low, only RMB 0.06 per pack (RMB 150 per case, or per 2,500 packs). The current specific excise tax as a tobacco control policy instrument has minimum impact. The specific excise tax is administratively simple for collecting tax revenue and may also be used as an effective instrument to monitor smuggling or shipment of counterfeit cigarettes. If the goal is to reduce smoking and improve health, then the Chinese government should consider increasing the specific excise tax from its present level (RMB 0.06 per pack) by RMB 1 per pack, RMB 2 per pack, or a higher amount in order to attain the international median range of the tax rate.

The Chinese government could adjust the *ad valorem* tax to make its rate uniform, preferably at the higher rate. Another option would be an adjustment in both the specific excise tax and the *ad valorem* tax.

Reconsideration of Tax Revenue-sharing Between the Central and Local Government

The purpose of the local government's protection and expansion of its local tobacco industries (both leaf production and cigarette manufacturing) is to maintain the local tax revenue and keep workers employed. As noted, the local government is sometimes willing to subsidize economically inefficient factories in overproduction of tobacco leaf and cigarettes. This is one of the consequences of the current tax revenue-sharing scheme between the central and local government. If the Chinese government continues to keep its national monopoly company for tobacco production, it might be more effective and fiscally more efficient to consider the tobacco tax as central government revenue. Instead of sharing revenue with the local government, as is done under Germany's tobacco consumption tax system, for example,[13] the central government would collect and keep the entire tobacco tax revenue and let the Ministry of Finance and other central government agencies address revenue allocation to local government.

Issue of Earmarked Tax

An earmarked tax designates its revenue for spending on specific government programs. The practice of earmarking tax revenue for a variety of governmental sectors is common in many countries. The practice of sharing tobacco tax revenue between the central and local government is a form of earmarking. In fact, in the United States, at least one third of all federal, state, and local government expenditures are from earmarked taxes.[47] For example, the taxes on gasoline and automobiles are earmarked

For tobacco control purposes, it would be important to earmark tobacco tax revenues for tobacco control efforts. Examples of such a strategy around the world have shown that raising the tobacco tax and earmarking part of its revenue for tobacco control is a particularly effective tobacco control policy.

for highway financing, the property tax is used for public school education, the Social Security tax for retirement, and the cigarette tax for health promotion, health care services, and environmental maintenance.

One of the justifications for earmarking a tax is the concept of a "user's fee" or "compensation principle." For instance, smokers expose nonsmokers to pollutants that are harmful to health. Smoking increases the cost of health care among smokers, thereby placing a burden on nonsmokers (who are taxpayers or who pay insurance premiums). Tobacco farming damages fertile lands, and the processing of tobacco leaf causes asthma and lung damage to women and children on tobacco farms. Eliminating the tobacco leaf tax at the local level and using the additional specific excise tax to subsidize the substitution of other crops in place of tobacco leaf is another form of an earmarked tax. Around the world, there are numerous instances of earmarking the tobacco tax for health care services, health insurance, and health promotion; the United States, Thailand, Australia, the United Kingdom, and other countries represent such examples.

Public finance experts have argued that earmarking may not be a good tax budgeting procedure since it introduces rigidities that impede proper allocation of general revenue among competing uses. However, there are also benefits to earmarking taxes, and Chinese government has already implemented earmarked taxes, including educational taxes, environmental protection taxes, and gasoline taxes. Among the proposed earmarked taxes, the Chinese government is considering Social Security and environmental protection as two top priorities. Because smoking is a source of indoor pollution and tobacco leaf production damages land, it would be justifiable to use a portion of tobacco tax revenue for the environmental protection agenda. For tobacco control purposes, it would be important to earmark tobacco tax revenues for tobacco control efforts. Examples of such a strategy around the world have shown that raising the tobacco tax and earmarking part of its revenue for tobacco control is a particularly effective tobacco control policy.[47]

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Conclusions and Recommendations

Conclusions

Tobacco currently kills one million people a year prematurely in China, almost 3 times the number caused by air pollution and 30 times the number of deaths caused by HIV/AIDS. In 2002, tobacco smoking was responsible for the loss of about 10 million Disability Adjusted Life Years (DALYs) in China, and close to a half million additional DALYs were lost due to secondhand smoking.

The economic cost of three major smoking-attributable diseases — cancer, cardiovascular disease, and respiratory disease — was RMB 41.0 billion (or US$ 5 billion) measured in the year 2000 value, a conservative estimate based on the human capital approach. Using the willingness-to-pay approach, the cost of smoking in China was as high as RMB 172.1 billion (or US$ 21 billion) in the year 2000.

The price of cigarettes in China almost doubled between 1990 and 2005. However, when adjusted by the consumer price index and the relative increase in income versus the relative increase in cigarette prices, cigarettes became twice as affordable in this same period. The relatively small increase in the real price has made cigarettes more affordable in China and less costly than in neighboring countries.

Smoking has an immediate negative impact on smoking households by diverting household income from essential expenditure, such as food, housing, clothing, and education. Furthermore, the excessive medical spending attributable to smoking and consumer spending on cigarettes was estimated to be responsible for impoverishing 54 million Chinese in 1998.

In 2005, China's state-owned tobacco monopoly (CNTC) produced 1.7 trillion cigarettes, generating a profit and tax of RMB 240 billion (US$ 30 billion). However, the share of the industry's contribution to central government revenue declined from 11.4 percent in 1995 to 7.6 percent in 2005. The industry employed about a half million people, 0.51 percent of total employment in the country's manufacturing industry, or 0.06 percent of the total national employment. China entered the WTO in 2001. With the reduction of tariffs on cigarettes and tobacco leaf, foreign cigarettes have become more competitive in the Chinese market. China is in the process of eliminating inefficient factories and consolidating production. The government is taking steps to address employment issues as the tobacco industry has restructured. In the future, therefore, the government's dependence on tobacco tax revenue will decline. Further CNTC has the overall responsibility to decrease its national tobacco leaf production quotas and processing of tobacco leaf. Empirical surveys among farming households show that although some tobacco farmers have received higher economic returns from tobacco farming over time, especially in Yunnan province, others have much lower returns from tobacco than from other crops. The relatively low return from tobacco leaf could be due to an oversupply. The incentive to the local government of collecting 20 percent of tobacco leaf tax revenue leads the local government to encourage farmers to plant tobacco leaf above and beyond the CNTC quota. The surplus of tobacco leaf has become a source for underground cigarette manufacturing of counterfeit cigarettes.

Tobacco currently kills one million people a year prematurely in China. ... In 2002, tobacco smoking was responsible for the loss of about 10 million Disability Adjusted Life Years (DALYs)....

China's central government and local government play important roles with respect to both the supply and demand for cigarettes. In 2006, the Chinese government abolished all agricultural product taxes but retained a special tobacco leaf tax of 20 percent of CNTC's purchase price for the local government. This tax raised RMB 3.74 billion, about 0.013 percent of the total local government revenue in 2005.

Currently, China has a 17 percent value-added tax at the cigarette production level. In addition, the central government collects (1) a specific excise tax — RMB 150 per case (50,000 cigarettes or 2500 packs) or RMB 0.06 per pack — and (2) an *ad valorem* tax — a 45 percent tax rate for cigarettes with a wholesale price higher than or equal to RMB 50 per carton (or RMB 5 per pack) and a 30 percent tax rate for cigarettes with values less than RMB 50 per carton. The Chinese government claims that the current cigarette tax rate is about 60 percent of the producer's price, which is about 40 percent of the retail price, much lower than the international median tax rate, which is between 65 percent and 70 percent of the retail price. Thus, there is ample room for China to raise the tax on cigarettes.

Given empirical evidence of the negative impact of smoking on health and on the Chinese economy and the relatively low cigarette prices, there is a need to raise the tobacco tax rate to reduce smoking in China. To determine the impact of taxation on smoking and on government revenue and the population's health, the key parameter is the effect of price on cigarette consumption (price elasticity). Based on previous economic demand studies in China, two different price elasticities (–0.15 and –0.50) were used in this paper to simulate the impact of an increased tobacco tax. Because the current specific excise tax is very low, RMB 0.06 per pack, it seems that the most likely tobacco tax reform option is to increase the specific excise tax. The simulation model estimated the effects of increasing the specific excise tax by 1 RMB per pack (or the equivalent of 51 percent of the retail price) up to RMB 4 per pack (equivalent to 68 percent of the retail price).

An increase in the specific excise tax of RMB 1 on a pack of cigarettes, with a price elasticity of –0.50... would increase government revenue by RMB 64.9 billion(US$ 7.9 billion), save 3.42 million lives, reduce medical costs by RMB 2.68 billion, and generate a productivity gain of RMB 9.92 billion (US$ 1.21 billion) for the Chinese economy.

Increasing the specific excise tax by RMB 1 at a price elasticity of –0.15 would increase government tax revenue by RMB 85.4 billion, save 1.0 million lives, reduce medical costs by RMB 820 million, and achieve a productivity gain of RMB 3 billion. On the other hand, the cigarette industry and tobacco farming could lose RMB 5 billion in the short term; 1,656 jobs also would be lost. However, the ratio of the tax revenue gain to the loss in the tobacco economy is close to 17 to 1. Put in other terms, the potential tobacco sector loss would be 5.9 percent of the gain from the government's additional tax revenue in the aforementioned scenario.

An increase in the specific excise tax of RMB 1 on a pack of cigarettes, with a price elasticity of –0.50 (e.g. smoking participation elasticity at –0.20), would increase government revenue by RMB 64.9 billion (US$ 7.9 billion), save 3.42 million lives, reduce medical costs by RMB 2.68 billion, and generate a productivity gain of RMB 9.92 billion (US$ 1.21 billion) for the Chinese economy.

An additional specific excise tax at the producer level could be administered efficiently and effectively

without changing the existing Chinese tax collection system. Given the wide range of cigarette prices in China, a high specific excise tax would be an effective way to keep low-priced cigarettes off the market to achieve the goal of tobacco control and to improve health. The tax simulation estimates show that the additional government revenue obtained from the specific excise tax would greatly exceed the loss of revenue for tobacco farmers and for the cigarette manufacturing industry. In fact, the magnitude of the revenue loss is quite minimal — between 1 percent and 2 percent of the revenue for the entire sector. The additional tax revenue could be used to subsidize crop substitution for tobacco leaf, retrain displaced employees in the cigarette industry, and provide for health and welfare programs for low-income persons or families as well as tobacco control programs via earmarking.

Recommendations

The empirical economic analysis and tax simulation results presented in this report clearly support the policy position that increasing the tobacco tax in China as a highly effective instrument for tobacco control.

Increase the cigarette tax

The Chinese government should consider significantly increasing the cigarette-specific excise tax, which is currently RMB 0.06 per pack (RMB 150 per case), by at least RMB 1 per pack (RMB 2,500 per case) and gradually increasing it to a much higher amount while maintaining the current *ad valorem* tax. In so doing, the government should simplify the current two-tier *ad valorem* tax into one single rate to prevent producers from arbitrarily adjusting the brand price to pay a lower tax rate. To maintain the effectiveness of tobacco control, the specific excise tax must be automatically adjusted for inflation, and ideally adjusted to address increased consumer purchasing power as well. China should consider increasing the overall tax rate beyond 60 percent over time.

... increasing the tobacco tax in China [is] a highly effective instrument for tobacco control.

Remove the tobacco leaf tax

In the long run, the Chinese government should consider removing the special tobacco leaf tax. To mitigate revenue loss at the local level from the elimination of the special tobacco leaf tax, the central government could increase the cigarette-specific excise tax and transfer parts of the additional cigarette tax revenue back to local government.

Reform revenue sharing between the central and local government

The Chinese government should consider removing tobacco tax revenue sharing between the central government and the local government and use instead the existing central government revenue transfer mechanism between the central government and local government to support local fiscal needs. In the future, the contributions of the cigarette industry to government revenue may become smaller, given the increasing importance of multinational tobacco companies in the Chinese tobacco market. The role of the Chinese central government should be to pursue a more aggressive tobacco control strategy, consistent with the FCTC provision to increase the tobacco tax.

Earmark the additional tax revenue

The Chinese government should consider using a proportion of the additional cigarette tax revenue for tobacco control activities, such as media anti-smoking

campaigns, enforcement of nonsmoking legislation, staffing of tobacco control units, and potentially for coverage of health care expenses for the uninsured low-income population. The combined price and non-price tobacco control campaigns will maximize China's efforts to reduce the impact of tobacco on society.

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