

# The Study on Taxable Mode in China's Cigarette Consumption Tax

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**Abstract** –Smoking is the top threat to human health in today's world which brings great economic and social burden to people. The cigarette consumption tax is now one of the most effective means on tobacco controlling. China adjusts its the tobacco tax system to strengthen the control of tobacco consumption, which accords to the promise of China's joining in WHO Framework Convention on Tobacco Control. This paper points out the shortcomings of China's current cigarette consumption tax and indicates the advantages of increasing tobacco consumption quantity tax. Based on the research about Cigarette demand by the previous scholars, the author choose three different price elasticity of demand and imitate the impacts on cigarette consumption, cigarette consumption tax revenue, smokers quantity and mortality when tobacco consumption tax increases by 1 RMB, 2RMB, 3 RMB or 4 RMB. The simulation results show that the benefits of raising cigarette consumption tax is greater than its cost so that raising cigarette consumption tax can be a good way to control tobacco consumption.

**Keywords** – Cigarette consumption tax; Quantity-based collection; Economic impact

## 1. Introduction

China is a tobacco production and consumption country where tobacco industry is an important source of national finance income. However tobacco consumption has also brought the extremely serious external diseconomy. According to the calculation, the total economic cost causing by smoking is up to 223.72 billion RMB in 2008 including medical fee based direct economic loss of 39.08 billion RMB which accounts for 17.5%, early death based indirect economic loss of 184.64 billion RMB which accounts for 82.5%. It's proved by international experience that improving cigarette consumption tax can effectively reduce the tobacco consumption. The effective tax rate in China's cigarette retail link is about 40% which is much lower than the international cigarette consumption tax rate of the median (65% ~ 70%). Thus there is a lot of space to increase the level of taxes so as to control tobacco consumption in China.<sup>[1]</sup>

Foreign research on tobacco consumption tax regulation mainly concentrated on the price demand elasticity. Though there are differences in model and

data, the results of the study showed that improving tobacco consumption tax helps reduce tobacco consumption. Becker (1988), Jha and Chaloupka (2000) hold the view that tobacco prices increase can effectively reduce youth tobacco consumption.<sup>[2][3]</sup> Conclusions of foreign research provide a reliable basis to the perfection of China tobacco consumption tax system.

China's tobacco consumption tax research began in the 1990 s. From the view of domestic existing research literature, there are mainly two ideas about tobacco consumption tax ways: Meijuan Luo (2003) insists reforming from ad valorem collection to complete quantity-based collection, while Weibo Xing takes for maintaining the combination of ad valorem collection and quantity-based collection.<sup>[4][5]</sup> On the basis of previous studies, this paper intends to study the problem of current tax assessment mode and simulate the economic impact by improving specific cigarette consumption tax so as to help improve China's tobacco consumption tax system.

## 2. The brief introduction of cigarette consumption tax assessment model in China

According to the 2011 smoke control report, more than 3000 people everyday die from smoking related disease in China, about 74% of the non-smokers suffer from secondhand smoke exposure, so it's urgent to control tobacco consumption. Control smoking and enhance national health have become global consensus. The world health organization puts forward six specific policy measures to suppress the popularity of the cigarette. The six measures are: monitoring tobacco use and prevention policies; Protect people from cigarette smoke harm; Provide help to give up smoking; Warning cigarette harm; To ensure that the tobacco advertising, promotion and sponsorship and improve cigarette consumption tax. Among them, improve cigarette consumption tax has been proved to be the most effective measures, especially for the role of inhibition of teenagers smoking maximum.

## 2.1. The current cigarette consumption tax assessment mode in china

In China, cigarette is divided into two kinds according to the sales price: class cigarette (price $\geq$ 70 RMB each) and secondary cigarette (price $<$ 70 RMB each). Since 2001, Chinese government runs a cigarette consumption tax assessment mode of mainly ad valorem collection with partially quantity-based collection. Firstly collect 150 RMB fixed cigarette consumption tax per box (50000 branches) which means 0.003 RMB/branch, and then collect at ad valorem rate according to the actual appropriation price of cigarette enterprises. AD valorem duty is collected in two links. In industrial production link, class cigarette is collected at 56%, and secondary cigarette 36%. In Cigarette wholesale link, all cigarette wholesale and retail business units and individuals are imposed a 5% AD valorem tax from the wholesale cigarette sales (excluding value-added tax).

**Table1.** The current cigarette consumption tax taxable items and tax rates table

Items	Tax rate		Collection of links
	Quantity tax rate	AD valorem tax rate	
class cigarette	0.003RMB/branch	56%	industrial production link
secondary cigarette	0.003RMB/branch	36%	industrial production link
Wholesale of all cigarettes		5%	wholesale link

## 2.2. The current problems of China's cigarette consumption tax assessment mode

Overall, in recent years, The Chinese government has been trying to adjust the cigarette consumption tax and has obtained some achievements which are gratifying. However we must be soberly aware of many problems of assessment mode in China's cigarette consumption tax.

(1) The determination of cigarette taxable price takes high cost and accuracy is difficult to guarantee. China has large Numbers of cigarette manufacturing enterprise, what's more, each enterprise produce many cigarettes with different specifications and brands. Under this condition, it's really difficult to guarantee the accuracy of taxable price only depending upon the tax department to check and ratify every enterprise's tax price of each brand and specification. It would be easy to cause unfair cigarette consumption taxes and heavy national tax losses.

(2) Cigarette tax price often lag behind changes of market price, tax erosion is serious. According to the state administration of taxation regulation, within one year, only when the retail prices of cigarette with a single brand fell more than 20% and at the same time the decrease time lasted six months, the cigarette tax price can be adjusted. However, in China's socialist market economy system, cigarette price changes with the market supply and demand so that it is difficult to accurately predict market changes in one year time which will create a negative situation that the cigarette tax price with a specification once determined, the variation in a

relatively long period will generally not happen again. Tax price adjustment often serious lag behind changes of market conditions which will further aggravates cigarette tax's unfair phenomenon between different brands.<sup>[6]</sup>

At present, under the circumstances of low specific duty, the most effective choice of cigarette consumption tax reform is to improve specific duties. Specific tax can not only help ease the rate of increase in price, but also a good medicine to control low-price cigarette market. Specific duties can use different sensitive degree to price from high and low cigarette consumers and decrease low cigarette purchase with no change of price between high and low cigarette.

## 3. The economic impact simulation analysis of improving cigarette consumption tax from quantity tax

When we think about the question whether specific duty limit of cigarette consumption tax needs improving, we need further analyzes the influence after its improving. If it could have inhibiting action on cigarette consumption, positive influence on financial revenue, or a control function to the number of smokers and mortality, we shall increase the limit of cigarette consumption tax. If not, we shall think about why, and how can change it to adjust to have a good influence. This paper simulated the influence on cigarette consumption, financial income, and the number of smokers and mortality when specific duty limit of cigarette consumption tax increase 1, 2, 3, 4 RMB, and further study whether the effectiveness of

improving cigarette consumption tax from quantity is positive or not so as to provide a certain basis on improving the specific duty of cigarette consumption tax.

### 3.1. The determination of cigarette price elasticity of demand

In order to study the influence of improving specific duty limit of cigarette consumption tax, we need analysis the relationship between cigarette prices and consumption which can be represent in quantitative way. Price

elasticity of demand is the key parameter during the process of impact simulation on the economy for the reason that it measured the price change's influence on consumption. In the academic research, there are two kinds of methods to the analysis of cigarette demand: one kind is based on time sequence set material or mixed collections of data method; and another is based on the individual level of cross-sectional survey data method. At present, the main research conclusions of cigarette price elasticity of demand are in the table 2 below:

**Table2.** The main estimations of China's cigarette price elasticity of demand

Data type	The author	Time range	Analysis unit	Estimation results
Event sequence set data	Zhengzhong Mao,Jialin Jiang <sup>[7]</sup>	1981-1993	Sichuan province	-0.47,-0.80
				-0.54
Cross-sectional and time series hybrid data	Hu,Mao <sup>[8]</sup>	1980-1996	The national	-0.35(short-term)
	Zhengzhong Mao,Dewei Hu, Gonghuan Yang <sup>[9]</sup>	1980-2002	The national	-0.66(long-term)
				-0.18(short-term)
				-0.61(long-term)
Cross-sectional data	Bai Y,Zhang Z <sup>[10]</sup>	1997-2002	Provinces, municipalities and autonomous regions	-0.84
	Zhengzhong Mao,Jialin Jiang <sup>[11]</sup>	1995	door (sichuan province)	-0.69
	Zhengzhong Mao,Gonghuan Yang,Jieming Ma <sup>[12]</sup>	1998	16 Counties (individual)	-0.514
	Lance,Akin,Dow,Loh <sup>[13]</sup>	1993-1997	Door (9 provinces)	-0.007
				-0.082
				-0.15
	Zhengzhong Mao,Dewei Hu, Gonghuan Yang <sup>[14]</sup>	2002	The national (individual)	-0.06(Quit smoking)
				-0.09(Reduce quantity)

As is shown as the above data, the estimated price elasticity is from 0.007 to 0.84. We can sort them into three categories according to size:

(1) The highest price elasticity is about -0.80, and there are two research results of such in eight studies. Although international often use -0.80 as a developing country's cigarette elasticity of demand, Chinese smokers seem to have not so strong reaction to price changes in short-term, which is more like long-term price elasticity. Therefore, this article selects -0.8 as long-term price elasticity. (2)The moderate price elasticity is from -0.50 to -0.60, and there is almost half the estimated results are in this range. This kind of elastic digital are most commonly cited in the literature of the medium income and high income countries. Hu Mao used the national data to do research which is very representative, so this article selects -0.54 as comprehensive price elasticity. (3)

The lowest price elasticity is from -0.007 to -0.154, which is China's latest research results by taking use of a national representative large sample to estimate. So this article selects -0.15 as short-term price elasticity. The explanation to China's low cigarette price elasticity of demand may be as follows: cigarette has very big difference in price from 1.00 RMB/bag to more than 100.00 RMB/bag, and then when the cigarette price changes (improve), smokers are easy to buy lower price brand of cigarette, or give up smoking.

This paper selects long-term price elasticity (-0.8), comprehensive price elasticity (-0.54), short-term price elasticity (-0.15) and material in 2009 as the baseline data to do simulation calculation. It's known that annual average cigarette retail price is 10.6 RMB/bag in 2009, and the actual tax rate (in the retail price calculation) is about 50%, that is 5.3 RMB. Cigarette total sales are 107

billion bags, and cigarette tax is 567.1 billion RMB in 2009.<sup>[15]</sup>

### 3.2. The influence on cigarette consumption by improving specific duty limit of cigarette consumption tax

We can calculate the influence on cigarette consumption according to the price elasticity of demand. For example, when the cigarette of the elasticity of

demand is -0.15, cigarette consumption's reduce amplitude is equal to the change range in price multiplied by -0.15. It also means that when the specific duty increase 1 RMB, cigarette consumption rate of change would be -0.014, and cigarette sales would be 105.5 billion package. Other price elasticity of demand situations suits for the same reason. Therefore, the simulation results of influence on cigarette consumption based on data in 2009 are in the table 3 below:

**Table3.** Simulation of the influence on cigarette consumption

Items	The level of 2009	Specific duties increase			
		1RMB	2RMB	3RMB	4RMB
Cigarette retail price (RMB /bag)	10.6	11.6	12.6	13.6	14.6
Cigarette sales (Hundred million bags)	1070				
Price change rate		0.094	0.189	0.283	0.377
	-0.15	-0.014	-0.028	-0.042	-0.057
Sales rate of change	-0.8	-0.076	-0.151	-0.226	-0.302
	-0.54	-0.051	-0.102	-0.153	-0.204
	-0.15	1055	1040	1025	1009
Cigarette sales	-0.8	989	908	828	747
	-0.54	1015	961	906	852

As is shown as the above data, cigarette sales will decrease when improving specific duty limit of cigarette consumption tax no matter in what kind of price elasticity of demand. Among them, when the cigarette price elasticity of demand is -0.8, cigarette sales decrease most. We can conclude that cigarette sales tax increase can really add the smoke control effect, especially for some teenagers. Generally speaking, most smokers from teenagers to start smoking so that high taxes could force back adolescents with no economic source and make the cigarette consumption become no water source, and then later smoke control will enter the benign cycle.

### 3.3. The influence on fiscal revenue by improving specific duty limit of cigarette consumption tax

Cigarette consumption tax is an important source of national finance, about 10% of the national fiscal revenue each year. If we improve cigarette consumption tax feasibly, cigarette consumption tax increase would make up for the fiscal income decrease causing by cigarette consumption reduced. The simulation results of influence on financial revenue are in the table4 below:

**Table4.** Simulation of the influence on financial revenue

Items	The level of 2009	Specific duties increase			
		1RMB	2RMB	3RMB	4RMB
Cigarette retail price (RMB /bag)	10.6	11.6	12.6	13.6	14.6
Unit tax amount	5.3	6.3	7.3	8.3	9.3
The total tax rate (% , according to the retail price meter)	50%	54%	58%	61%	68%
	-0.15	1055	1040	1025	1009
Total sales (Hundred million bags)	-0.8	989	908	828	747
	-0.54	1015	961	906	852
	-0.15	6646	7590	8504	9388
From the cigarette tax (Hundred million RMB)	-0.8	6232	6632	6870	6947

	-0.54	6395	7015	7520	7924
	-0.15	975	1919	2833	3717
Tax accrual (Hundred million RMB)	-0.8	561	961	1199	1276
	-0.54	724	1344	1849	2253

Improving cigarette consumption tax will inevitably lead to consumption reduction and may further impact to financial income which obviously deserves policy makers' attention. As is shown as the above data, cigarette total sales will decrease when improving specific duty limit of cigarette consumption tax no matter in what kind of price elasticity of demand. But the increased consumption tax from quantity causes the unit tax increase, resulting in cigarette consumption tax not only not reduce, but also greatly increased, the most of which achieve 371.7 billion RMB. Thus improving specific duty limit of cigarette consumption tax not only won't erosion financial income by cigarette sales decrease, but also can promote the increase of financial revenue in a certain degree. We can also found that when price elasticity is -0.15 which means the price elasticity is very low, cigarette consumption tax rate higher, the influence to improve fiscal revenue better.

### 3.4. The influence on the number of smokers and mortality by improving specific duty limit of cigarette consumption tax

Zhengzhong Mao, Dewei Hu and GonghuanYang estimated the smoking status (participate in smoking) price elasticity and current smokers' cigarette price elasticity of demand by using a nationally representative sample of smoking survey in 2002. They drew the conclusion that about 40% of the cigarette consumption reduced from decline in the number of smokers, and 60% of the smokers from smoking reduction.<sup>[9]</sup> This paper adopts their conclusion, supposing that smoking participate elasticity is 40% of the total price elasticity, smoking strength elasticity is 60% of the total price elasticity. The simulation results of influence on the number of smokers and mortality based on data in 2009 are in the table5 below:

**Table5.** Simulation of the influence on the number of smokers and mortality

Items	The level of 2009	Specific duties increase			
		1RMB	2 RMB	3RMB	4 RMB
Cigarette retail price (RMB /bag)	10.6	11.6	12.6	13.6	14.6
Unit tax amount	5.3	6.3	7.3	8.3	9.3
The total tax rate (% , according to the retail price meter)	50%	54%	58%	61%	68%
At present adult (age 15 +) smoking	31%				
-0.15		30.70%	30.40%	30.10%	29.80%
Adults (ages 15 +) smoking					
-0.8		29.40%	27.80%	26.20%	24.60%
-0.54		29.92%	28.84%	27.76%	26.68%
Currently smoking total number	356				
Smoking total number					
-0.15		352.55	349.11	345.66	342.22
(million)					
-0.8		337.63	319.25	300.88	282.50
-0.54		343.60	331.19	318.79	306.39
Reduction of the number of smokers (million)					
-0.15		3.45	6.89	10.34	13.78
-0.8		18.37	36.75	55.12	73.50
-0.54		12.40	24.81	37.21	49.61
Save life (million)					
-0.15		0.86	1.72	2.58	3.45
-0.8		4.59	9.19	13.78	18.37
-0.54		3.10	6.20	9.30	12.40

As is shown in the above data, we can have some findings as follows: from transverse view, given the size of elasticity, the tax rate is higher, the number of smokers is lower and cigarette consumption also reduces more.

From longitudinal view, when the price elasticity increases, the same increase tax would prevent more people from cigarette consumption, and save more people life. That is to say, higher cigarette demand price and

higher tax rate would do a great job in controlling smoking number and reducing more unnecessary pain and death.

#### 4. Conclusions

In short, China's current cigarette consumption tax is composed of very small specific duties and relatively large AD valorem tax which has some unconquerable defects. <sup>[16]</sup> To realize fair of cigarette taxes and reduce the loss of national tax, we shall launch the cigarette consumption tax assessment mode reform from mainly ad valorem collection with partially quantity-based collection to mainly quantity-based collection with ad valorem collection or complete specific duties. Improving specific duty limit of cigarette consumption tax can have inhibiting action on cigarette consumption, positive influence on financial revenue, and a control function to the number of smokers and mortality. The price elasticity of demand is bigger, the effect of smoke control is better. At the same time, what deserves our great attention is that the age of China's smokers tends to be lower and cigarette really has a very bad influence on teenagers' psychology, behavior and physical health. Since teenagers represent the future, if we can effectively prevent them into smoking queue, then smokers will be like water without a source, which means smokers will be less and less. For the reason above, adolescent smoking control is the key to reduce global smoking. Since most adult smokers form smoking habits from 20 years and this special consuming groups often have a higher sensitivity to price, it would be very advisable and effective to increase cigarette consumption tax so as to reduce the number of young smokers.

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#### Vitae



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