

The Reform Plan of Tobacco Excise: Who Benefit More for China?

Feng Cui^{*1}, Huixia Xing²

School of International Trade and Economics, University of International Business and Economics, Beijing 100029, China; *Correspondence 201900130006@uibe.edu.cn

Abstract

It's well-known that excise is highly relative to tobacco taxation and profit of tobacco industry. The aim of this study is to analyse the impact of reform plan of tobacco excise on taxation of the government and revenue of tobacco industry, and also to compare who will benefit more. Using publicly available statistics, this article analyzes the interest adjustment of reform plan, the TaXSiM model is employed to calculate tobacco taxation of provinces when excise levied moves from production link to marketing link, and estimate the effect of industrial agglomeration in tobacco industry. The results show that if excise reform plan is implemented, local governments will gain small amount of incremental taxation since tobacco is a commodity with restricted consumption, excise reform plan can't bring new tax source for governments. Whereas excise reform plan is favourable for optimal allocation of resources and adjustment of internal structure in tobacco manufacturing link, which can bring great profit for industry. Therefore, the reform plan of tobacco excise is more beneficial for tobacco industry than local governments, and the tobacco control for China will become more arduous.

Keywords: excise reform plan; industrial agglomeration; tobacco taxation; local governments; China.

Tob Regul Sci.™ 2022; 8(1): 96-111

DOI: doi.org/10.18001/TRS.8.1.10

Introduction

In October 2019, China State Council promulgated the “Promotion Plan for Adjusting the Division of Revenue between Central and Local Governments after Implementing Large-scale Tax and Fee Cut” (called “The Plan”) [1], which clarified the directions of excise reform. The first is, under controllable situations, part items of excise collected in the production (or import) link will be gradually moved to the wholesale or retail link for collection, which may promote local government to raise its revenue sources and improve consumption environment; The second is to identify the taxation base of each province, after the base of excise revenue handed over to central government, the incremental part of excise revenue will belong to local government to ensure the stable distribution of existing financial resources between central government and local governments. Therefore, the aim of two directions of the plan is to raise additional revenue for local governments, alleviate financial strain of local governments, and support the implementation of current reduction policy of tax and fees.

According to directions of the plan, the focus of excise reform is to raise stable tax sources for local government. In total existing 15 items of excise, tobacco is the key item for excise reform plan for three reasons: First, tobacco possesses fiscal importance. The latest numbers indicate that total taxation and profit that tobacco industry realized constituted 6.18% of national fiscal revenue, and excise revenue of tobacco products constituted more than 50% of national excise revenue as of 2019.

In 2018, the distribution of excise revenue in 15 items is, tobacco products, refined oil, cars and alcohol products constituted 52.34%, 33.81%, 8.85% and 3.30% respectively, the other 11 items only constituted 1.7% [2]. Second, tobacco product, unlike other commodity items, is regulated by state monopoly system in China, which means tobacco will be more controllable than other commodity items when excise levied in marketing link. Finally, among four main items (tobacco, refined oil, cars, and alcohol), which constituted 98.3% of total excise revenue, only tobacco industry is more feasible in terms of the possibility of industrial integration driven by excise reform. The shifting of tax-collection link will make local governments highlight the marketing link while undermine the production link. Meanwhile, the weakening of production link provides an obvious opportunity of industrial integration for tobacco industry. Specifically, refined oil industry is highly dependent on resource land, thus it will be difficult to move manufacturing plants. Car industry tends to invest large scale of fixed asset, it's hardly to integrate enterprises in production process. Alcohol industry owns massive producers and consumers nationwide and lack the state monopoly system to supervise deals, industrial agglomeration is also extremely difficult in this industry. Therefore, tobacco industry is important for Chinese excise reform especially in the long run and from the local governments and tobacco industry perspectives.

The existing literature has widely discussed the importance of tobacco in ensuring national fiscal revenue. In China, Tobacco Monopoly Law claims that tobacco product is one of important tax sources since 1991, now tobacco has been the largest source of tax revenue [2, 3]. To gain stabilized fiscal revenue from tobacco product, local governments have supported the development of tobacco manufacturing enterprises within its province [4, 5]. About relationship between tobacco tax system and governments' taxation, some studies discussed that tobacco is an addictive product with low price elasticity [6], tax and price policies can achieve the dual goals of tobacco control and don't jeopardize the existing state revenue [7-9]. However, only a few studies have discussed the effect of changes of collection link of tobacco excise on governments' taxation revenue. [4] found that when collection link shifts to marketing link, tobacco tax revenue will mainly be affected by tobacco consumption. Furthermore, the plan of excise reform will promote the taxation economically in developed regions due to high consumption capacity of local population [10, 11].

From perspective of industrial agglomeration, it is known that agglomeration makes enterprises with similar economic activities distribute in definite geographic space [12], which helps to shorten distance between various elements, share resource, technology and facilities, ultimately generate more revenue [13-16]. In addition, governments' behaviors may influence the level of industrial agglomeration, and conclusions are not consistent. Some studies found that government behaviors promote the development of industrial agglomeration [3], while other studies found high intervention of local government in economic activities affect allocation efficiency of production elements, resulting spatial distribution of economic activities scattered [5] [17]. For example, Specific to tobacco industry, with typically capital-intensive, highly concentrated and integrated features [18], it generally owns high degree of agglomeration in many countries such as South Africa, Russia and Australia [17, 19, 20]. China also increased its agglomeration level of tobacco industry between 1998 and 2007 by reducing the numbers of small-scale manufacturing enterprises and re-adjusting organizational structure, which has significantly improved the efficiency of industry [21]. However, the structural adjustment of tobacco industry in China is still hindered due to high correlation between tobacco taxation of local government and production link of tobacco product [4], the extent of industrial agglomeration of tobacco industry in China remains considerably low. To increase industrial agglomeration level and improve sustainability performance, tobacco industry can through supply chain management to achieve this goal [22, 23].

Overall, the existing literature contains two consensuses: First, tobacco is an important tax source for local governments. Second, tobacco industry will gradually reduce numbers of production enterprises and increase industrial agglomeration, to enhance competitiveness of whole industry. Since both consensuses are related to

tobacco excise system, the “Excise Reform Plan” will influence taxation revenue of local governments and development of tobacco industry. In this respect, the contribution of this study to the existing literature is twofold. First, most studies discussing tobacco tax mainly on excise, this study calculates all turnover taxes that cover whole processes including production and circulation, which expands the scope of tobacco tax. Second, tobacco industry is the priority industry, which has contributed tax and profit to fiscal revenue for more than one trillion yuan for six consecutive years. This is the first study that simulated the agglomeration benefits of tobacco industry using latest available data in China, and exclusively focus on tobacco industry and local governments, to compare the impact of revenue and actual operability in two sides.

Taxation Revenue Analysis of Local Governments

According to the definition of World Health Organization, tobacco tax refers to all turnover taxes levied on tobacco production and circulation link, including value-added tax, excise, urban maintenance and construction tax, and education surcharges [24]. And few tax levied on tobacco leaves in agricultural link. In China, tobacco tax is important for national fiscal revenue. Latest data show that the tax and profit of tobacco industry including production link and marketing link (wholesale or retail process) was about 1205.6 billion yuan in 2019, and the fund turned over to national finance reached 1177 billion yuan, which constituted 6.18% of national general public budget revenue as of 2019. As seen on Table 1, under current Chinese tobacco tax system, the tax share of tobacco tax paid by production, wholesale and retail link are commercial enterprises are 71%, 25%, 4% respectively. Among all links, production is the main source of tobacco tax, which means, for local governments, tobacco taxation is decided by the production of local cigarette manufacturing enterprises, rarely relevant to cigarette consumption. Due to this reason, local governments have supported the development of local tobacco enterprises in past decade, which made market competition in different regions become severe, and resulted high fragmentation in national tobacco market. The plan refers that shifting collection link of excise from produce to wholesale or retail link, and transferring incremental tax revenue to local governments after the taxation base handed over to central government. The plan will have profound impact on local governments and tobacco industry, especially in weakening local protectionism and eliminating disordered tax competition of tobacco market.

(1) The introduction to current tobacco tax system

Tab. 1 analyses the composition of tobacco tax levied on production and circulation links in current tax system. First, tobacco excise constitutes the highest proportion of tobacco tax, nearly to 67%, and tobacco item constitutes over 50% of national excise. According to current tobacco tax system, all excise is assigned to central government. Second, VAT constitutes the second highest proportion of tobacco taxation. Tobacco, with high-price and tax rate, generates relatively large value-added tax revenues from production and marketing links. The VAT revenue is divided between the central and local governments with proportion of 5:5. Third, the urban maintenance and construction tax, and educational surcharges are relatively small, which are assigned to local government. Finally, tobacco leaf tax that levied on the purchasing process of tobacco leaf constitutes the lowest proportion of

tobacco tax, about 1%, which is assigned to local government. Therefore, among tax species contained in tobacco tax, excise is the priority.

Table 1: tobacco tax of each link in tobacco industry

Link	Tax species	Tax revenue (billion)	Tax share	tobacco revenue in different links (billion)	The share of tobacco revenue in different links (%)
produce	excise	464.68	70.67%	657.57	71%
	VAT	122.44	18.62%		
	Urban construction tax and education surcharge	70.45	10.71%		
wholesale	excise	156.58	67.62%	231.54	25%
	VAT	50.15	21.66%		
	Urban construction tax and education surcharge	24.81	10.71%		
retail	VAT	24.80	89.29%	27.78	3%
	Urban construction tax and education surcharge	2.98	10.71%		
purchase	tobacco leaf tax	11.00	100%	11.00	1%

Notes: The value is calculated by TaXSiM model, using 2019 data from China Tobacco Statistical Yearbook such as market share, sales volume and prices of different cigarette brand.

(2) The impact of tobacco excise reform on local government

This study uses TaXSiM model [25-28] to calculate tobacco tax contained in produce, wholesale, and retail links. The model is widely used to analyze the relationship between tax system structure and governments' taxation revenue, as well as the reactions of suppliers and traders in tobacco industry to tobacco tax policies. The adjusted regulations about excise of the plan will further affect fiscal relationship between local governments, and bring changes to the development mode of tobacco industry. Before implemented, government needs to scientifically demonstrate the potential influence of the plan.

The plan proposes that the implement of excise reform will first need to set taxation base that governments collected in most recent years, and the incremental part over cardinality will be assigned to local governments, which helps to ensure the stability of existing financial resources of central and local governments. Therefore, this study emphasis the base setting and discuss the incremental amount of tobacco tax. Obviously, the base cannot be determined by production but sales volume, which is dependent on the consumption capacity of local residents. According to current excise system, this study uses national cigarette production to calculate total tobacco tax in 2018, then calculate the tax revenue of each province according to the proportion of sales volume of each province in 2017. Further calculate the difference of tobacco tax between sales volume and production volume in each province, so the changes of tobacco tax of each province can be observed, the results are shown in Tab. 2 and Fig. 1 below.

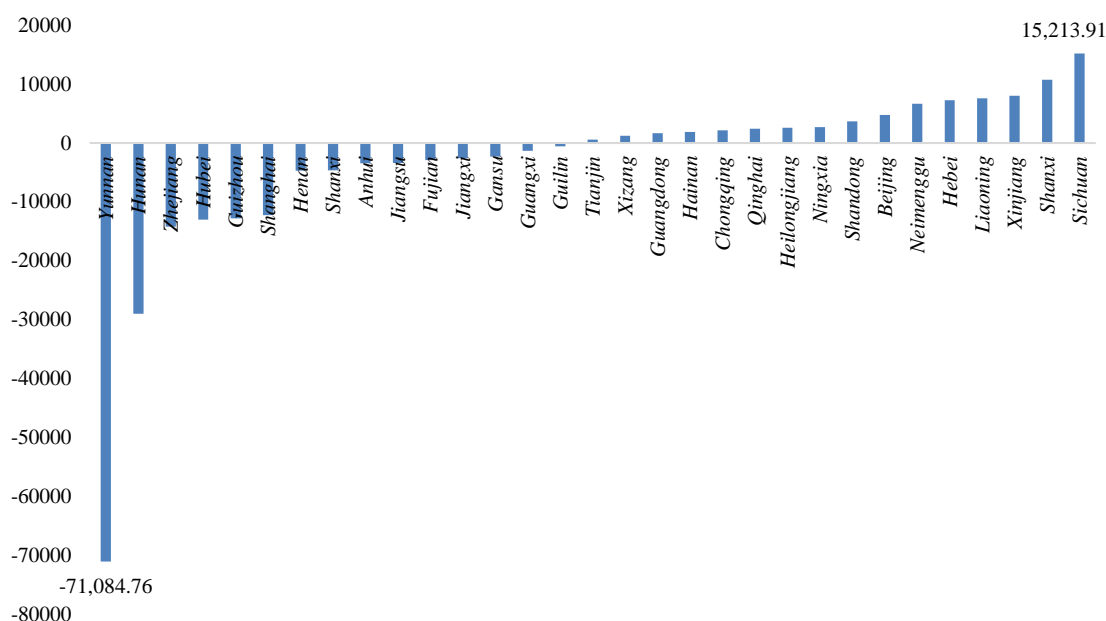
Table 2: The tobacco tax of each province based on production volume versus sales volume in 2018
(Unit: million pieces; billion yuan)

Province	Production volume principle			Sales volume principle			Different value of excise
	Produce volume	excise	tobacco tax	Sales volume	excise	tobacco tax	
Beijing	17461	4.35	6.77	40470	9.13	14.76	4.78
Tianjin	22028	5.48	8.54	26997	6.09	9.85	0.60
Hebei	77403	19.27	30.00	117731	26.56	42.94	7.28
Shanxi	15545	3.87	6.03	64703	14.60	23.60	10.72
Neimenggu	20845	5.19	8.08	52495	11.84	19.15	6.65
Liaoning	27580	6.87	10.69	64230	14.49	23.43	7.62
Jilin	42743	10.64	16.57	44658	10.07	16.29	-0.57
Heilongjiang	39379	9.81	15.26	55005	12.41	20.06	2.60
Shanghai	85720	21.34	33.22	40223	9.07	14.67	-12.27
Jiangsu	135840	33.82	52.65	135020	30.46	49.24	-3.37
Zhejiang	166150	41.37	64.40	120406	27.16	43.91	-14.21
Anhui	93550	23.29	36.26	88003	19.85	32.10	-3.44
Fujian	86530	21.55	33.54	82748	18.67	30.18	-2.88
Jiangxi	66914	16.66	25.94	62512	14.10	22.80	-2.56
Shandong	126505	31.50	49.03	156019	35.19	56.90	3.69
Henan	153971	38.34	59.68	149095	33.63	54.38	-4.71
Hubei	132270	32.94	51.27	88357	19.93	32.22	-13.00
Hunan	231398	57.62	89.69	126740	28.59	46.22	-29.03
Guangdong	154630	38.50	59.93	177965	40.14	64.90	1.64
Guangxi	75607	18.83	29.30	77582	17.50	28.29	-1.33
Hainan	12272	3.06	4.76	22001	4.96	8.02	1.91
Chongqing	43113	10.74	16.71	57030	12.86	20.80	2.13
Sichuan	47167	11.74	18.28	119510	26.96	43.59	15.21
Guizhou	117691	29.31	45.62	73240	16.52	26.71	-12.78
Yunnan	364505	90.76	141.28	87232	19.68	31.81	-71.08
Xizang	0	0.00	0.00	5412	1.22	1.97	1.22
Shanxi	84358	21.01	32.70	72547	16.36	26.46	-4.64
Gansu	48635	12.11	18.85	43503	9.81	15.87	-2.30
Qinghai	0	0.00	0.00	10649	2.40	3.88	2.40
Ningxia	0	0.00	0.00	12001	2.71	4.38	2.71

Xinjiang	0	0.00	0.00	35695	8.05	13.02	8.05
-----------------	---	------	------	-------	------	-------	------

Notes: The tobacco tax contains production and marketing links of cigarettes, including excise, value-added tax, urban construction tax and educational surcharges. Original available volume data of each province are from “2017 China Tobacco Statistical Yearbook”, and prices and market shares are based on 2018 data.

Figure1 the tobacco taxation difference in provinces when collection link shifts from production to marketing (Unit: million yuan)



Notes: the regional differences of tobacco tax are mainly from the difference of cigarette sales and production volume, actually affected by the difference between consumption structure and industrial structure.

As understood from Tab. 2 and Fig. 1 above, tobacco tax differences caused by the sales and production volume principle are still large. For example, the two extreme provinces with tobacco tax differences are Yunnan, Sichuan province respectively. The excise of Yunnan based on sales volume will be 71 billion less than current excise based on production volume, whereas Sichuan will achieve 15.2 billion more. However, there will be two problems in setting the tobacco tax base. First, whether the base of each province is fixed or variable, and how to arrange provinces whose tax revenue do not reached the base or exceeding the base. Second, whether the base cover the change of cigarette sales in future, which is important for local governments to find new tax sources. Generally, the definition of excise base means local governments will not only have to complete the base handed over to central government, but also have to increase the sales volume of cigarettes to obtain incremental retained tax revenue, thus the revenue of tobacco excise belong to local governments will increase after deducting the base of each province. Therefore, more cigarettes are consumed, more retained excise revenue that local governments will achieve. If the base is set high, local governments will retain relatively little revenue ultimately. In addition, with the consumption of tobacco products, 50% of value-added tax, urban construction tax, as well as education surcharges, are fully belong to local governments.

Profit Analysis of Tobacco Industry

Tobacco industry, as typical capital-intensive industry in worldwide, needs to seek concentrated market structure. However, the market concentration of tobacco industry in China is relatively low

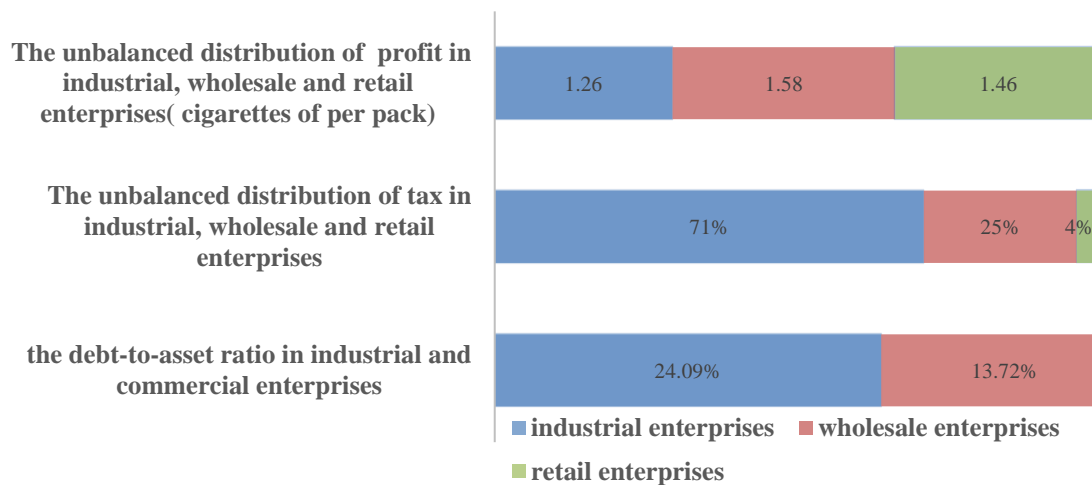
compared with other countries, which is not conducive to the development of tobacco industry. Although geographical dependence does not exist in producing link of cigarette, the production volume of cigarette in each province is basically fixed. As production link is the most important source of local governments' taxation, tobacco manufacturing enterprises in each province are supported by local governments, thus it is great difficulty for tobacco industry to integrate production plan of different provinces, which led to inefficient allocation of resources in tobacco industry. According to National Bureau of Statistics, current distribution of tobacco manufacturing enterprises across country is severely fragmented. Among 32 provinces (cities, districts) of China, except for Xizang and Qinghai, each province owns its tobacco manufacturing enterprises, a total of 94. This has resulted in the industry cannot independently reorganize and upgrade the production process of manufacturing enterprises, further hinders overall growth of sales volume and profitability of tobacco industry.

(1) The development status and existing problems of Chinese tobacco industry

Nearly all provinces have established local tobacco manufacturing enterprises. To achieve sustainable cigarette tax and profit, each province protects its tobacco consumer market and hinder cigarette sales of other provinces through sales management of local tobacco monopoly bureau. As a result, local governments provide the favorable environment for small & medium cigarette brands of local manufacturing enterprises and avoid shock of priority cigarette brands of other provinces to local tobacco market. However, local protection has gradually divided national tobacco market into multiple parts and formed blockade in different market parts. For example, the proportion of inter-provincial cigarette transactions across country fell to 54.4% in 2017 from 56.1% in 2015, a decrease of 1.7 percentage points. The intra-provincial market dependence of medium-sized cigarette brands has increased, such as Huangshan (from Anhui province), Jiaozi (from Sichuan province), and Taishan (from Shandong province), but the expansion in out-provincial market has not shown any significant improvement. Whereas the large brands, such as Hongtashan (Yunnan), Furongwang (Hunan) and Nanjing (Jiangsu), encountered severe blockades in out-provincial market, these brands have returned to local provincial market.

The distribution of taxes and profits in production and marketing links of tobacco industry is unbalanced. In 2018, there are 33 provincial-level Tobacco Monopoly Bureaus nationwide, and 17 provincial-level manufacturing enterprises. The profit of Tobacco State Monopoly Administration is 41.870 billion yuan more than manufacturing enterprises. As seen on Fig. 2, under current tobacco excise system, the distribution of tax burden among production, wholesale and retail enterprises are 71%, 25%, and 4%, respectively. The distribution of profit of per pack cigarette between manufacturers, wholesalers and retailers is 1.26, 1.58 and 1.46 yuan, respectively. In total, the operating environment of manufacturing enterprises has continued to deteriorate. Specifically, manufacturing enterprises endure 71% of whole tax burden, while the profit ratio in all links is only 29.0%. And the debt-to-asset ratio of manufacturing enterprises is 10.37% higher than commercial enterprises. Furthermore, with attaching importance to production link, the current marketing process of tobacco products has not fully extended to wholesale or retail link. China National Tobacco Corporation (CNTC) cannot fully master consumer demand, brand preferences and price elasticity, etc., which has led cigarettes delivered to each province in commercial link cannot fully match consumer demand.

Figure 2 The unbalanced distribution of tax and profit between production and marketing enterprises



Source: Tax burden and profit data are from TaxSiM model in 2018. The weighted average profit of per pack cigarettes is calculated by five types of cigarettes. And the debt-to-asset ratio is from “2019 China Tobacco Yearbook”.

Affected by above-mentioned factors, in past decade, the operating efficiency of tobacco industry has continued to decline, market competitiveness of traditional large-scale manufacturing enterprises has been undermined, whereas competitiveness of small and medium-scale manufacturing enterprises has increased. Generally, the entry barrier of tobacco manufacturing enterprises is not high due to industry features of low-tech, simple raw-material and flavoring ingredients. Considering that large-scale enterprises invest more capital, they can fully play the advantage of economies of scale than small and medium-scale enterprises, and occupy more share in national consumption market. However, large-scale manufacturing enterprises, such as Yunnan, Shanghai, Hunan, Fujian provincial enterprise, although still occupy major share in domestic market, their production volume, sales volume and economic benefits have continued to decline in whole industry. As the small and medium-scale cigarette manufacturers newly established have squeezed out the slice of traditional large-scale manufacturers. With the gap between different-scale manufacturing enterprises in whole industry narrows, the difficulty for CNTC to regulate production process within tobacco industry will increase.

With influence of traditional large-scale tobacco manufacturers weakening, the market value of priority cigarette brands cultivated by traditional large-scale manufacturing enterprises in domestic is also declining, which is extremely unfavorable for tobacco products that emphasis brand effects. For example, in 2017, among top 15 brands in domestic sales volume of cigarette, the sales growth of 8 brands is lower than the average level of priority brands, and sales growth of 7 brands had a year-on-year decline; In 2016-2017, the number of emerging small brands in industry have reached 348, the average annual sales volume of new brand remained at low level of 6 thousand boxes. Therefore, from perspective of whole industry, the overall development of priority brands is restricted, the reduced value of priority brands is mainly offset by the value growth of small and medium-sized brands. Meanwhile, numerous brands with slight scale and faint prospect continue to emerge.

(2) The effect of excise reform plan on tobacco industry

In order to integrate production resources and improve competitiveness, tobacco industry has undergone three transformations. The first time was the implementation of tobacco state monopoly system in 1983, which unified the management of tobacco companies across country, eliminated private or unqualified manufacturers and sales agencies, and established barriers to tobacco industry in form of tobacco monopoly administration ultimately. Until 2018, China has formed 33 provincial-level

tobacco monopoly bureaus, and there are many municipal and county tobacco monopoly bureaus and 510 wholesale commercial companies affiliated to them. The second time was in 1998, CNTC implemented the policy of “closing, stopping, merging, and transferring” to small-scale manufacturing enterprises across country, which increased concentration of production link. The third time was in 2003, making the link of production and marketing separately, which separated the production functions from provincial tobacco monopoly bureau and began to establish provincial tobacco manufacturing companies of same level to improve segmentation of domestic tobacco market.

Table 3 Tobacco market concentration in China

Year	Number of tobacco manufacturing enterprises with large& middle scale	Tobacco manufacturing enterprises	Producing brands	Brand CR4	Brand CR10
2018	74	116	88	—	—
2015	82	129	90	27.52%	52.69%
2012	91	143	98	25.02%	43.64%
2009	97	172	138	14.64%	25.77%
2006	101	177	228	8.79%	15.64%
2003	146	263	584	—	—
2001	143	316	1049	—	—

Notes: According to National Bureau of Statistics, large and medium-scale manufacturing enterprises are who with 300 employees or more and whose main business income is 20 million yuan or more, the number of large and medium-scale manufacturing enterprises is from National Bureau of Statistics. Market concentration (market share of sales volume of top 4 or 10 cigarette brands in I, II, III brand class) is calculated by industry agglomeration formula $CR_n = \frac{\sum_{i=1}^n X_i}{\sum_{i=1}^N X_i}$, and data are from “China Tobacco Statistical Yearbook”.

However, as the result of strong correlation between development of tobacco industry and local finances, current tobacco state monopoly system has not fully realized free circulation of cigarettes across country, the development of tobacco industry is restricted. The local governments implemented administrative protections for local enterprises through local tobacco monopoly bureau, which led to inefficient development of tobacco industry. In this respect, to promote the development of tobacco industry, policymaker should take measures from production and marketing aspects, accelerating industrial agglomeration in production link and strengthening consumer terminal development in commerce link, which will be the key to break industry predicament.

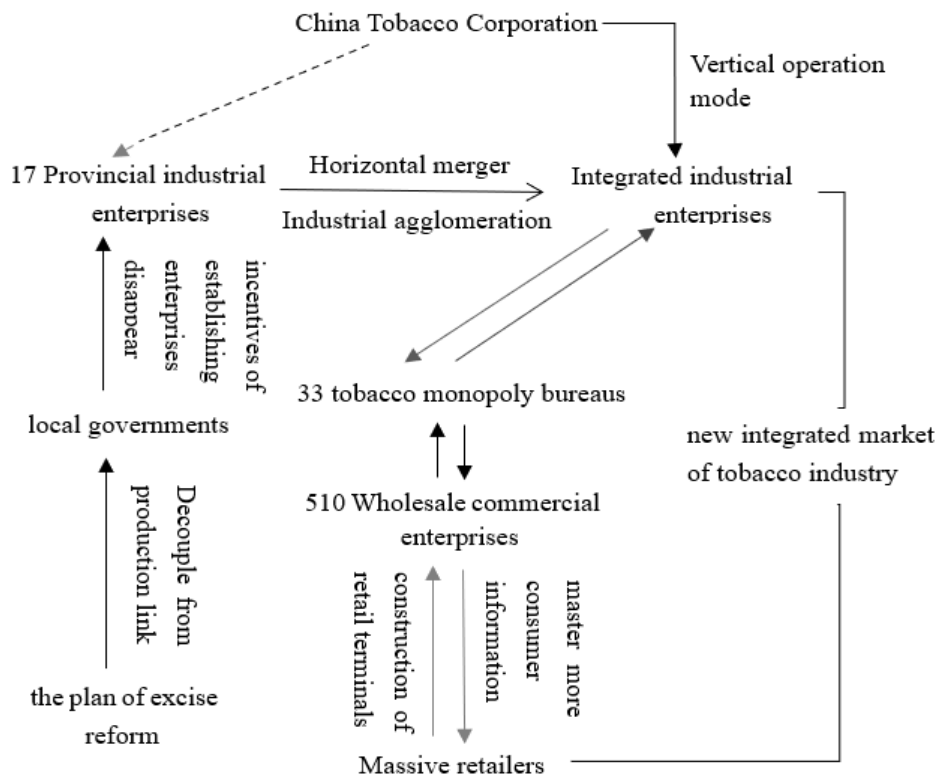
Tobacco taxation is mainly determined by tobacco excise because excise constituted 67% of tobacco tax in 2019. The changes in tobacco excise rate and collection links will affect tobacco production cost and operating cost of manufacturing enterprises, and further affect the relationship between commercial enterprises, manufacturing enterprises and local governments profoundly. Generally, cigarettes excise in production link is levied at the locations of manufacturing enterprises, and excise in wholesale link is levied at the locations of commercial enterprises. Tobacco excise is mainly levied in production link currently, and tobacco tax that local governments receive mainly depend on production volume of cigarettes. Therefore, local governments provide support to local tobacco enterprises to protect competitive environment. In the province, manufacturing tobacco enterprises focus on stabilizing market share, improving structure, and maintaining status, stabilize tobacco taxation of local government by preventing shock of other cigarette brands on local market.

Outside the province, with goal of expanding sales, occupying market, and seeking layout, manufacturing enterprises actively expand market of the outside province. This kind of horizontal tax competition between local governments has gradually aggravated the segmentation of tobacco industry.

In global manufacturing industry, tobacco is the typical industry with increased production centralization. Its vertical operating mode helps facilitate group's investment and financial decisions, exerts production advantages and maximizes group's interests. The excise reform plan brings opportunity for the upgrading of tobacco industry. Transferring collection link of tobacco excise backward will gradually decouple local finances from cigarette production, and turn to link local finances with cigarette sales. As shown in Fig. 3, the financial contribution of production link is reduced, local government will lessen connection with cigarette production, and local provinces will no longer actively establish cigarette manufacturing enterprises. CNTC can optimize and adjust production activities of tobacco industry across country through the negotiations with local governments, agglomerate production activities to low-cost, large-scale advantageous enterprises such as Yunnan and Hunan manufacturing enterprises. Through agglomeration of production link, tobacco industry can fully take advantages of economies of scale, centralize more production resources, and further reduce manufacturing costs of production link. As tax share paid by tobacco manufacturing enterprises fall, the operating capital of manufacturing enterprises will increase, which is beneficial to financial management. Manufacturing enterprises, will pass along these taxes to consumers through increased price. Before shifted, manufacturing enterprises undertake the tax burden for consumers, which reduces the operating capital available for production of enterprise and increasing financial cost. When collection link transferred to wholesale or retail link, it will be easier to transfer tax burden to consumers.

Thus, the plan of excise reform will balance the distribution of tax burden and profits between tobacco production (that is, production process) and marketing link (the wholesale or retail process), which is beneficial to development of manufacturing enterprises. And provincial tobacco monopoly bureau no longer gives priority to guaranteeing cigarette sales of local manufacturing enterprises, cigarettes produced by manufacturing enterprises in different provinces will circulate freely throughout country. Market barriers caused by local protectionism will gradually collapse, new integrated market of tobacco industry will be formed. Meanwhile, with continually construction of retail terminals, tobacco monopoly bureau incorporates online ordering, electronic settlement, online distribution, and modern logistics into China tobacco sales system, which will promote tobacco monopoly administration to master more retail outlets or consumer information, enable tobacco manufacturers make more accurate judgments on market demand and consumer preferences, and increase supply compliance with consumer demand in cigarette market. Compared with past, both production and marketing enterprises in tobacco system turn to promote structural upgrades, and shift the development goal from pure pursuit of profit to fostering relationship between enterprises and consumers.

Figure 3 Roadmap of impact of excise reform on tobacco industry



To sum up, the reform of tobacco fiscal and taxation system will greatly increase the separation degree between production link and marketing link in industry, which will bring new opportunities for production integration, retail terminal construction, and vertical management mode in tobacco monopoly system. First, under premise that the amount of total domestic tobacco consumption is stable, integration of production resources can fully play advantages of tobacco leaf bases and lower production costs, and protect the priority cigarette brands. Second, in the process of shifting collection link backward to sales link, tobacco industry and tax authorities speed up construction of retail terminal [29], grasping more information of changes in consumer demand, which is conducive to establishment of an integrated production & circulation system based on consumer demand. Finally, tobacco industry conducts optimized management and regulation based on changes of consumer demand. CNTC adopt flexible strategy to regulate the production and supply of cigarettes of different grades in nationwide according to consumer demand, then formulate production plans for main manufacturing enterprises in different areas, finally to form integrated production and circulation system.

Comparison of Impact of Excise Reform Plan on Local Government and Tobacco Industry

Tobacco product is key item in excise, and the contribution of tobacco industry has reached more than one trillion yuan of taxes and profits for five consecutive years. This study compares the effects of excise reform plan on local governments and tobacco industry, whether the plan can raise additional revenue for local government or promote long-term development of tobacco industry.

(1) The comparison of benefit on local governments and tobacco industry

1. When discussing the impact of tobacco excise reform on local finances, the scale of tobacco taxation revenue in next few years shows uncertainty. Under the reform direction of “fixing base and adjusting incremental revenue”, tobacco incremental taxation mainly comes from the growth of two

parts, one is consumption and the other is price. However, in long run, there is no increasing trend in cigarette consumption restricted by goal of tobacco control in 2030 and adjustment of household expenditure structure. “Healthy China 2030” set the goal that adult smoking rate will be reduced from 26.6% in 2018 to 20% in 2030 [30], which means cigarette consumption will drop by 43%, about 51 billion packs of cigarettes in next decade. Furthermore, according to data of The China Family Panel Studies (CFPS), the proportion of cigarette consumption expenditure in household consumption expenditure continues to decline. It can be indicated that the realization of incremental tobacco taxation is more likely from the increase of cigarette price. Since the price of cigarette is uncertain, the amount of incremental tobacco taxation belonged to local governments will in uncertainty.

2. From perspective of industrial agglomeration benefits in tobacco industry, the upgrade of national cigarette production can expand whole profits of production system. The annual profit after industrial agglomeration will increase by 130.26%-175.14%, which is about 2.5 times the profit before agglomeration. Based on 2017 data of China Tobacco Statistical Yearbook [31], this study uses TaXSiM model to analyze agglomeration benefits. First, we compare production, sales volume, income margin, and harvested area of total 17 provincial cigarette manufacturing enterprises across country, and find manufacturing companies with most obvious concentration advantages are orderly Yunnan, Hunan, Henan, Jiangsu tobacco corporation, etc. Then, based on different production costs of these advantageous companies, we estimate economic benefits that will increase when national cigarette production is concentrated in these advantageous companies.

The results show that the increased benefits of production system are mainly from reduction of manufacturing cost of cigarette rather than fees rates. The result of tab. 4 is still a conservative estimate for calculation of benefits of industrial agglomeration. On one hand, after industrial agglomeration, the average domestic manufacturing cost may be further reduced on basis of estimated high-efficiency cost of agglomeration. On other hand, the strengthened construction of retail terminals to achieve precise matching will further reduce circulating cost. Thus, on the basis of large domestic cigarette consumption, the benefits of production system may further increase, and actual benefit scale should be greater than calculated value. Meanwhile, due to backward shift of collection link, tax burden of manufacturing enterprises will be greatly reduced, the occupation of manufacturing and operating funds in production system will be reduced. Furthermore, the reduced tax burden of manufacturing enterprises will be passed to consumers through shift of tax collection. The relationship between manufacturing enterprises, commercial enterprises, and consumers will be adjusted.

Table 4 Agglomeration effects of tobacco industry in different combinations

Agglomeration mode Beneficial indicator of production system	Single mode	Multiple mode			
	Yunnan	Yunnan, Hunan	Yunnan, Hunan, Henan	Yunnan, Hunan, Jiangsu	Yunnan, Hunan, Henan, Jiangsu
Distributed production volume in main enterprises (billion pieces)	2364.25	1824.49 539.76	1666.71 493.08 204.46	1545.44 457.20 361.61	1430.72 423.26 175.51 334.76
Adjusted production cost in main enterprises (yuan/pack)	0.57	0.57 1.92	0.57 1.92 1.83	0.57 1.92 1.76	0.57 1.92 1.83 1.76
Weighted average production cost (yuan/pack)	0.57	0.88	0.96	1.01	1.07

The first part of increased industrial profit (billion yuan)	216.482	179.819	170.079	163.830	156.656
Adjusted fees rates (%)	7.69%	7.69% 6.10%	7.69% 6.10% 9.47%	7.69% 6.10% 3.67%	7.69% 6.10% 9.47% 3.67%
The second part of increased industrial profit (billion yuan)	-3.850	-1.162	-2.534	-0.985	1.493
Adjusted industrial profit (billion yuan)	334.042	300.067	288.955	284.256	279.560
Industrial profit increases (%)	175.14%	147.15%	138.00%	134.13%	130.26%

Note: Industrial agglomeration refers to production concentration of manufacturing enterprises in tobacco industry, which merely contain production link.

(2) The comparison of realistic possibility on local finances and industrial income

1. Base setting is crucial to excise reform, which is prerequisite for influencing taxation of local governments and tobacco industry. After tax collection link shifting from production to wholesale link, provinces will rely on tobacco wholesale link, which will inevitably result in tax revenue change in provinces with high production or sales volume. Meanwhile, CNTC who wants to adjust inter-regional cigarette production plans, to gather the production of small-scale manufacturing enterprises to large-scale manufacturing enterprises, will inevitably face pressure from different provinces. CNTC needs to negotiate with different provinces for the closely connection between tobacco taxation and fiscal revenue of local governments. Therefore, the approved base after negotiated is prerequisite for coordinating interest relations between provinces and ensuring sustainability of local excise, which will affect industrial agglomeration, layout optimization, and vertical management of tobacco industry.

2. Due to influence of many factors, the comprehensive effect of tobacco excise reform for improving local governments' tax system will be uncertain. Although the backward collection link may lead to a decline of tobacco tax revenue for major tobacco manufacturing provinces, and an increase in tax revenue for major sales provinces. Meanwhile, the trend of industrial agglomeration and the layout of tobacco industry may increase revenue of provinces with large-scale production volume. Provinces with large-scale manufacturing enterprises that own advantages of low manufacturing costs and sufficient source of tobacco leaves may crowd out the production space of other provinces with small-scale manufacturing enterprises. Furthermore, to protect tax sources and ensure trade volume of legal tobacco products in each province, Tobacco Monopoly Bureau needs to further improve its market management capabilities, strengthen regulation of circulation process of cigarette products, thus reduce trade volume of illegal tobacco products.

3. With changes in collection link and ownership of excise, commercial circulation management and industry organization structure of tobacco industry will need to be optimized and adjusted as a whole. The cost and difficulty of tax collection and management will increase when collection link backward, and loss of tax funds is more prone than production link. For example, in current system, tobacco excise completely belongs to central government, and 70% of excise sources is from production process. National Tobacco Corporation just needs to supervise around 100 cigarette manufacturing enterprises in production link in nationwide. When collection link backward to commercial link, whether wholesale or retail link, National Tobacco Corporation has to regulate massive wholesalers and retailers in different provinces, cities, and counties, which means great difficulty and high cost of collection and management. Furthermore, National Tobacco Corporation will complete required retail

terminal construction to cover massive cigarette retail outlets in nationwide. But it is still inevitable to miss calculation of tax collection in retail link.

Conclusions

China, having the largest consuming market in the world is one of the major producers of tobacco. The two directions of excise reform plan, shifting collection link backward and giving incremented tax revenue to local governments, will bring a new opportunity to development of tobacco industry while raise partial taxation revenue of local governments. Therefore, the reform plan of tobacco excise will mainly benefit tobacco industry for China.

Tobacco control in China will become more arduous when excise taxation is directly linked to local governments' revenue. Generally, the excise is mainly designed to regulate consumption behavior, including reducing consumption of commodities which are harmful to health or environment, and to regulate the distribution of tax burdens among different income classes, thereby it's more suitable for collection in production link, adjustment of multiple tax rates, and transfer to central government. Tobacco item of excise plays the functions of regulating consuming behaviors and stabilizing taxation revenue. When incremental part of tobacco taxation is assigned to local governments, the incentives of collecting taxation will be stronger while incentives of controlling tobacco consumption will be undermined. Local governments will be stimulated to promote consumption of tobacco products, which is contrary to excise function of regulating behavior.

The whole competitiveness of CNTC will greatly increase after tobacco industry undergoing the significant transformation. Due to the increasing competitive pressure of tobacco companies, tobacco industry needs to take measures to improve its efficiency. Through the reform plan of excise, tobacco industry will have the opportunity to readjust its organizational structure and provide strong institutional support effectively and marketing environment for the continuous expansion of large enterprises and priority cigarettes brands, which will rapidly enhance the competitiveness of CNTC in both domestic and international markets. In addition, this is not conducive to tobacco control.

The complexity of collection and management will greatly increase when tax is levied from production to marketing link gradually. Actually, tobacco industry has implemented tax avoidance in current excise system. Since current excise is mainly levied on production link, manufacturing enterprises pay less tax by setting lower ex-factory price in production link. Moreover, due to less excise levied in wholesale process, when wholesale price is set higher, the profit margin of wholesale will be large, whereas commercial enterprises don't have to undertake heavier taxes, thus the profit of manufacturing enterprises is lower than commercial enterprises. Therefore, to better control the collection and management of tobacco tax, excise should be levied more on production link and ex-factory price of manufacturing enterprises should be set higher, which means increase gross profit margin of production process.

Raise tobacco taxation for local governments through excise reform plan is tough. When the collection link of excise backward, it's the premise to ensure original quota of tobacco excise transferred to central government remain unchanged, then to seek sustainable incremental income for local governments. Meanwhile, for provinces with huge differences in production and sales volume, central government should consider the changes of taxation revenue of local governments. Therefore, to raise excise revenue of local governments, it is recommended to appropriately expand scope of sub-items of tobacco item in excise, such as taking into account e-liquid products or other tobacco products containing nicotine.

Conflict of Interest Statement

The authors declare no conflicts of interest.

Acknowledgment

None.

References

- [1] The State Council of the People's Republic of China. Promotion plan for adjusting the division of revenue between central and local governments after implementing large-scale tax and fee cut. (2019).
- [2] State taxation administration. China taxation yearbook, 2019.
- [3] L. Mingjuan, Countermeasures for tobacco industrial cluster development. *Tobacco Regulatory Science*. 7, 326-338 (2021). doi:10.18001/TRS.7.4.9
- [4] Wang Shigui, Li Baojiang. The institutional obstruction of “the strong getting weaker” in tobacco industry—Analysis from the perspective of tobacco tax and fiscal policies. *China industrial economics*, 12-19 (2002). doi:10.19581/j.cnki.ciejournal.2002.04.002
- [5] Chong-En Bai, Yingjuan Du, Zhigang Tao, S.Y. Tong, Local protectionism and regional specialization: Evidence from China's industries. 63, 397-417 (2004). doi:10.1016/s0022-1996(03)00070-9
- [6] H. Liu, J.A. Rizzo, Q. Sun, F. Wu, How do smokers respond to cigarette taxes? evidence from China's cigarette industry. *Health Econ*. 24, 1314-1330 (2015). doi:10.1002/hec.3084
- [7] C. Yeh, C. Schafferer, J. Lee, L. Ho, C. Hsieh, The effects of a rise in cigarette price on cigarette consumption, tobacco taxation revenues, and of smoking-related deaths in 28 EU countries--applying threshold regression modelling. *BMC Public Health*. 17,2017). doi:10.1186/s12889-017-4685-x
- [8] T.W. Hu, Z. Mao, J. Shi, Recent tobacco tax rate adjustment and its potential impact on tobacco control in China. *Tob. Control*. 19, 80-82 (2010). doi:10.1136/tc.2009.032631
- [9] Frank J Chaloupka, Kurt Straif, M.E. Leon, Effectiveness of tax and price policies in tobacco control. *Tob. Control*. 20, 235-238 (2011). doi:10.2307/41320112
- [10] Yang Xiaoshu, Tang Jinping, Wang youxing. Consumption tax reform and local financial equilibrium—from dual perspectives of moving backward tax payment stage and adjusting income division. *Public Finance Research*. 89-101 (2020). doi:10.19477/j.cnki.11-1077/f.2020.10.007
- [11] Xie Zhenfa, Xia Ninglu, Wu huiping. Reform of transformation of consumption tax from a central tax to a local tax. *Taxation research* 56-63 (2020). doi:10.19376/j.cnki.cn11-1011/f.2020.06.011
- [12] Guy Dumais, Glenn Ellison, E.L. Glaeser, Geographic concentration as a dynamic process Vol. 84, No. 2 (May, 2002), pp. 193-204 Published by: MIT Press Stable URL: <http://www.jstor.org/stable/3211771> Accessed: 31-12-2015 22:41 UTC. *The Review of Economics and Statistics*. 84, 193-204 (2002). doi:10.2307/3211771
- [13] Antonio Ciccone, R.E. Hall, Productivity and the density of economic activity. *American Economic Review*. 86, 54-70 (1996). doi:10.2307/2118255
- [14] J. Lu, Z. Tao, Trends and determinants of China's industrial agglomeration. *Journal of Urban Economics*. 65, 167-180 (2009). doi:10.1016/j.jue.2008.10.003
- [15] Li Shijie, Hu guoliu, Gao jian. Evolution of industrial agglomeration in China during the transition period: Theoretical review, research progress and exploratory thinking. *Journal of management world* 165-170 (2014). doi:10.19744/j.cnki.11-1235/f.2014.04.014
- [16] G.H. Hanson, Scale economies and the geographic concentration of industry. *Journal of Economic Geography*. 1, 255-276 (2001). doi:10.1093/jeg/1.3.255

- [17] A. B. Gilmore, M. McKee, Tobacco and Transition: An overview of industry investments, impact and influence in the former Soviet Union. *Tob. Control.* 13, 136-142 (2004). doi:10.1136/tc.2002.002667
- [18] C. Van Walbeek, Industry Responses to the tobacco excise tax increases in South Africa. *The South African Journal of economics.* 74, 110-122 (2006). doi:10.1111/j.1813-6982.2006.00051.x
- [19] A. Leahy, A. Palangkaraya, J. Yong, P.R.I.O. Intellectual, geographical agglomeration in Australian manufacturing. *Regional studies.* 44, 299-314 (2010). doi:10.1080/00343400902783248
- [20] Onur Koprulu, Bora Alkan, I. Alkan, An overview of tobacco economy in the world and in Turkey. *Journal of Applied Sciences Research.* 5, 1780-1784 (2009). doi: https://www.researchgate.net/publication/296090539
- [21] Li Suiming, Zhu Li. Market performance analysis of China's tobacco industry integration: 1998-2007. *Journal of management world* 10-14 (2009). doi:10.19744/j.cnki.11-1235/f.2009.07.002
- [22] A. Adesanya, B. Yang, B. Iqdara, F. Waness, Y. Yang, Improving sustainability performance through supplier relationship management in the tobacco industry. *Supply Chain Management: An International Journal.* 25, 413-426 (2020). doi:10.1108/SCM-01-2018-0034
- [23] H. Hofmann, C. Busse, C. Bode, M. Henke, Sustainability-related supply chain risks: conceptualization and management. *Business Strategy and the Environment.* 23, 160-172 (2014). doi:10.1002/bse.1778
- [24] WHO technical manual on tobacco tax administration. Geneva: World Health Organization. World Health Organization (2010).
- [25] K.E. Smith, WHO technical manual on tobacco tax administration. *Public Health.* 127, 193 (2013). doi:10.1016/j.puhe.2012.10.004
- [26] WHO, The WHO tobacco tax simulation model: user guide. Geneva: World Health Organization. 2018).<http://apps.who.int/iris/bitstream/handle/10665/260177/WHONMH-PND-18.3-eng.pdf;jsessionid=7EDC50BCD1EAD2B0EF6F67083628D77D?sequence=1>
- [27] M. Goodchild, A. Perucic, N. Nargis, Modelling the impact of raising tobacco taxes on public health and finance. *B. World Health Organ.* 94, 250-257 (2016). doi:10.2471/BLT.15.164707
- [28] M. Goodchild, R. Zheng, Early assessment of China's 2015 tobacco tax increase. *B. World Health Organ.* 96, 506-512 (2018). doi:10.2471/BLT.17.205989
- [29] L. Joossens, M. Raw, Progress in combating cigarette smuggling: controlling the supply chain. *Tob. Control.* 17, 399-404 (2008). doi:10.1136/tc.2008.026567
- [30] M. Goodchild, R. Zheng, Tobacco control and healthy China 2030. *Tob. Control.* 28, 409-413 (2019). doi:10.1136/tobaccocontrol-2018-054372
- [31] China State Tobacco Monopoly Administration. *China tobacco yearbook.* Beijing: China, Economic Publishing House, 2017.