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TOBACCO EXCISE TAX IN UKRAINE:
RECENT DEVELOPMENTS

The article is devoted to the analysis of tobacco excise tax policy in Ukraine. Special attention is paid to the possible effects of the latest change in tobacco excise tax system on the market demand structure.

Introduction and Problem Statement

During the centuries tobacco has been considered as an ideal consumer good for taxation. Already Adam Smith (1776) in his famous work "The Wealth of Nations" conjectured that levying a tax on tobacco can help poor people by giving the room to reduce the more harmful taxes, e. g. taxes on necessity goods or production factors. The classic of economic theory supposed that tobacco tax would allow labor demand to increase (since labor would become cheaper) resulting in the increase of poor people's income and the positive general effect on the economy.

In modern economic literature of Public Finance, we can find similar views on tobacco taxation issue. Following Cullis and Jones (1998), high cigarette excise taxes can be justified either on the basis of a market failure argument (merit want or externality-type arguments[1]) or an optimal tax argument that recognizes that excess burdens are smallest in case demand elasticities are lowest. However, it is worth mentioning that low price elasticity of demand on cigarettes is not unambiguously positive feature. On the one hand, it may be attractive since it allows to raise taxation significantly and increase revenue with only a modest effect on the level of consumption and thus a small

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[1] Smoking can be viewed by the society as an evil and as a negative externality since, for example, it causes pollution, increases probability of diseases, reduces productivity (smoking breaks).

excess burden. On the other hand, this inelasticity feature is unattractive since based on a merit good and externality arguments, the objective of government policy should be to reduce consumption, which is hard to achieve in this case. On the whole, given the price inelasticity argument, an increase of the tobacco excise tax, in fact, is motivated by the revenue-raising considerations.

Today governments of almost all countries tax tobacco products applying different taxation methodologies. In general, there are three main types of excise taxes[1]: specific, ad valorem, and their mix (or combination). Specific taxes are levied on the quantity of the product produced or consumed, e. g. a fixed amount per pack, per 1,000 cigarettes, per 1,000 grams of tobacco, whereas ad valorem taxes are a percentage of the taxable price per unit of tobacco products. It is noteworthy that all these types of excise tax have different effects on price, profits, tax revenue, efficiency and equity aspects. Thus, rational behaviour of profit maximizing producer implies that producers of cheap cigarettes would prefer ad valorem taxes while producers of expensive ones - specific taxes. Based on the public health consideration, i. e. that tobacco tax should discourage the consumption of cigarettes, specific tax would be preferable since it keeps the price of the cheapest cigarettes rather high and discourages low-income people from smoking; however, this works only if there is appropriate indexation with respect to inflation and can also have a negative effect on regressivity principle of taxation.

Till recently tobacco products in Ukraine were subject to the following four taxes: excise duty (purely specific type), Pension Fund charge, import duty, and VAT. Starting with the 1st of January, 2004, in place of fixed Pension Fund charge, the ad valorem part of excise tax was introduced. Thus now tobacco in Ukraine is taxed as a specific duty per unit of quantity and an ad valorem element based on the maximum retail price of 5 %. Precise quantitative changes in the tobacco excise tax are summarized in the *Table 1,* which is built according to the Ukraine's Law "On Excise Duty and Import Duty for Tobacco Products" dated 6.02.1996 and the Law of Ukraine # 849-1V dated 22.05.2003 "On Introduction of Amendments in the Law of Ukraine "On State budget of Ukraine for 2003" and in some other legislative acts".

Before turning to the analysis of possible effects which the described changes may induce, it is worth to consider the historical developments of tobacco tax policy in Ukraine and the recent situation on the tobacco market.

According to the study of Alcoholic and Drug Information Centre (Krasovsky et al., 2002), the history of tobacco excise taxes in Ukraine can be divided into three main periods: 1) reduction of excise rates, motivated by the supporting of manufacture (1993-1995); 2) increase in excise rates, induces by the tax revenue considerations (1996-1999); 3) tax stabilization (from the end of 1999).

Before 1993 tobacco industry was state-owned and there were no tobacco excise tax in Ukraine. On the 1st January, 1993, the common excise tax in the size of 70 % of the retail price was introduced. In December, 1993, the tax rate was reduced to 60 % and 45 % on filter and non-filter cigarettes correspondingly on the demand of the emerged foreign investors. The next two steps of the tax reduction were made in February, 1994 (to 50 % and 35 % correspondingly) and January, 1995 (to 40 % and 10 % accordingly). As a result of such policy, production increased only by 12 % (share of non-filter-cigarettes has also increased), tax revenues decreased, smuggling prospered, partly due to the lack of domestic production of filtered cigarettes[2].

In February, 1996, the tobacco excise tax was switched from ad valorem to specific system - 2ECU and 0.5ECU (1ECU since 1997) per 1000 filter and non-filter cigarettes correspondingly - which caused the increase in taxes by 1.3 and 2 times accordingly. In 1998 the tax rates on non-filtered cigarettes doubled again, and then on 3.08.1998, tax rates were increased to 3ECU/1000 and 2.5ECU/1000 correspondingly. However, due to the tremendous depreciation of hryvna in August, 1998, tax rates evaluated in hryvna rose sharply and, in response, government changed them to 2.5ECU/1000. The last increase was on 19.11.1999 when the common excise tax was set at the level of 10UAH/1000 (for non-filtered 7UAH/1000 until 1.07.2000). The result of this period policy was an increase in tax revenue and the share of non-filtered cigarettes.

Table 1. **The latest changes in the tobacco excise tax in Ukraine**

	Cigarettes with filter, UAH		Cigarettes without filter, UAH	
Old system	Specific	Pension fund	Specific	Pension fund
	11.5 per 1,000 sticks	2.5 per 1,000 sticks	5 per 1,000 sticks	1.5 per 1,000 sticks
New system	Specific	Ad valorem	Specific	Ad valorem
	11.5 per 1,000 sticks	5 % of max retail price	5 per 1,000 sticks	5 % of max retail price

[1] In Ukraine, excise tax is applied to a limited range of domestically produces or imported goods, including: alcoholic beverages, beer, tobacco and tobacco products, cars, petrol, diesel fuel and jewelry.

[2] In 1995, filtered cigarettes accounted only for 11 % of total production.

During the subsequent three years there were only several changes in the tobacco excise tax policy: decrease in non-filter cigarette excise to 5UAH/1000 starting with 1.01.2001 in order to fight the Russian smuggling, and increase in filter cigarette excise to 11.5UAH/1000 starting with 1.07.2001 in the wake of switch from purely specific to the mixed excise tax.

Regarding the situation on the Ukrainian tobacco market, one may assert that this industry is highly concentrated. Following tobacco industry review of "Business" newspaper, the five largest tobacco companies ("BAT Ukraine", "Reemtsma Ukraine", "Phillip Morris Ukraine", "JTI Ukraine", "Ligett-Ducat Ukraine") roughly cover 95 % of total production. In general, tobacco industry produced 80.9 bin cigarettes in 2002, which is 16 % higher than 2001 level.

As follows from the above, there was no case of the mixed tobacco excise tax earlier in Ukraine. Thus the introduction of such type of tax could start the new stage of the Ukrainian tobacco industry development and it is interesting as well as important to analyze the possible effects it may exert.

Analysis

Let us now analyze the potential impact of the current change in the excise tax policy on the consumer choice which may significantly influence the size of the collected tax revenue.

For convenience we make some relevant assumptions. First, we broadly divide all consumers into three groups according to their level of income: 1st low income individuals; 2nd middle income individuals; 3rd high income individuals. Then we assume that each group may include 2 subgroups: a) those who are highly addicted to cigarettes (they are more likely to prefer a certain type of cigarettes) and b) those who are not very addicted (they are likely to be more flexible in their choice). Second, all three types of customers make their choice in a three-dimensional world: filter cigarettes-non-filter cigarettes-other goods. Moreover, individuals with high income are inclined to consume filter cigarettes, with low income - non-filter cigarettes, and with middle income - both filter and non-filter cigarettes. In addition we assume that for any customer cigarette is a necessity good (i. e. as income decreases, the proportion spent on that good increases; formally

$$\frac{\partial\left(\frac{P_i X_i}{\sum_{j=1}^{m} P_j X_j}\right)}{\partial I} < 0,$$ where X_i is a necessity good,

I is an income, P is a price of a good while an indi-

vidual consumes *m* goods (/ = 1.../??)). Thus, the size of substitution and income effects (hence, the elasticity of demand) differs according to the type of the consumer. For example, the substitution effect will be the highest for the 2.o.-consumers whereas the income effect for the 1 .a.-consumers. It is also noteworthy that tax revenue from the ad valorem part of the excise tax can be less than expected if there is a significant substitution effect between filter and non-filter cigarettes (since non-filter cigarettes cost less).

Using the above stated assumptions, first, consider the situation graphically applying the standard microeconomic approach in order to see the possible effects of the tax change on the consumption pattern. According to the calculations based on the survey conducted by us in ten retail outlets, the current changes in the excise tax are expected to influence both absolute and relative prices of cigarettes. As follows from the *Table 2,* the price of filter *(F)* and non-filter *(NF)* cigarettes is going to rise on average as well as the relative price of filter with respect to non-filter cigarettes (tax incidence is likely to result in the price increase since demand is relatively inelastic and the tobacco industry is highly monopolised).

The expected change in the individual budget constraint corresponding to the arguments above is presented on the *Graph 1* in three dimension space. Here we can see that there must be a turning of the budget constraint surface (solid lines denote before change budget constraint, dotted lines - after) and

Table 2. **Tax incidence of the changes in the excise tax policy**

	Avg price, UAH	BEFORE CHANGE	AFTER CHANGE
		Tax incidence per pack from pension fund charge, UAH	Tax incidence per pack from ad valorem tax, UAH
Filter	3.5	0.05	0.175
Non-filter	1.5	0.03	0.075
Relative tax incidence F/NF		1.67	2.33
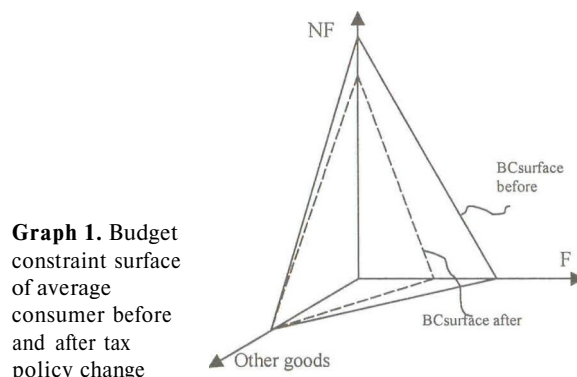
Graph 1. Budget constraint surface of average consumer before and after tax policy change
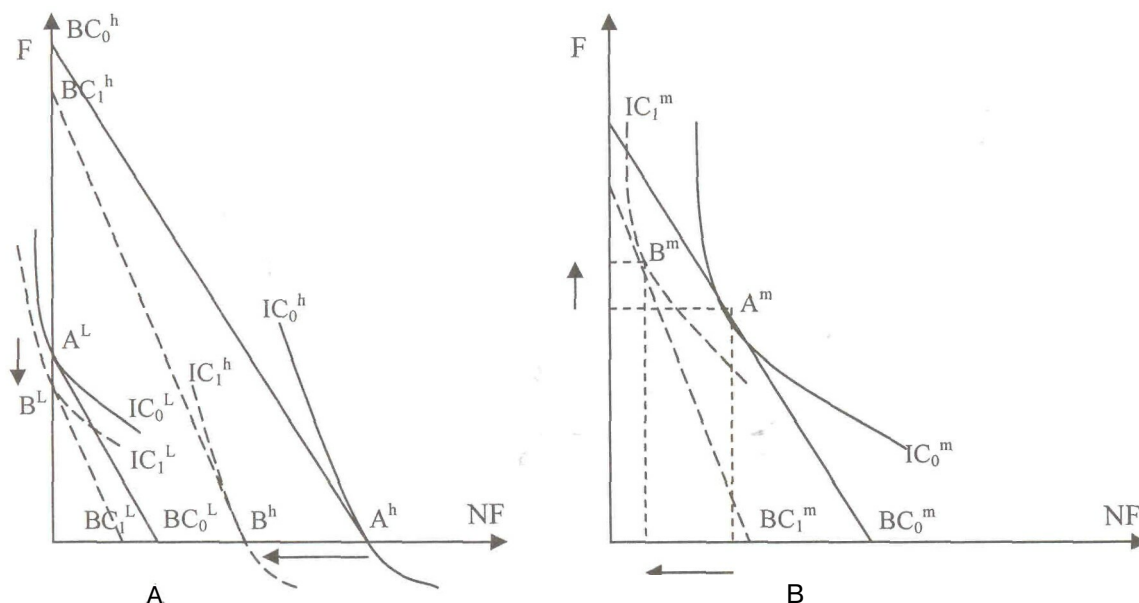
Graph 2. Substitution between filter and non-filter cigarettes for low (L), high (h),
and middle (m) income consumers

whereas precise outcome depends on the individual characteristics (such as tastes, income), it is clear that there will be a decrease in the welfare of smoking individuals. For convenience, further we will use two dimension grapfical representation of the discussed situation. Using the *Graph 2,* let us examine the potential substitution effects between filter and non-filter cigarettes. As follows from the assumptions and can be seen on the graph, low income individuals decrease the consumption of cigarettes (non-filter since they are assumed to consume only this type) and move to the lower indifference curve in response to the tax change. Some of those individuals (most probably l.b. consumers) can even quit smoking (this case will be considered more carefully below). Consumers with high income are most likely somewhat to decrease consumption of filter cigarettes; however depending on the substitutability of non-filter cigarettes for filter cigarettes, strength of income effect, and the degree of addiction, they can choose to consume partly filter and non-filter cigarettes in order to maintain the quantity of tobacco consumed. Anyway, the welfare of these individuals also decreases. Middle income individuals, who are assumed to consume both filter and non-filter cigarettes initially, are going to reduce the consumption of filter cigarettes and increase non-filter (move from A^m to B^m). While the degree of change in consumption pattern depends mainly on the substitution effect, the welfare of these individuals for sure decreases.

Thus, the introduction of ad valorem part of excise tax leads to the decrease in the welfare of smoking individuals since absolute prices of both types of cigarettes increases. Moreover, due to the increase in relative price of filter cigarettes, there must be some substitution between two types of cigarettes, and thus the tax appears to be distortive. Distortion also stems from the fact that in response to the price increase some individuals may choose to consume less cigarettes on the whole or even quit smoking (see *Graph 3).* In principle, an individual may choose any point on the *BC* segment on the new budget constraint (dotted line), still consumers with low degree of addiction and/or low income and hence with rather sensitive to prices demand (e. g. children) may stop smoking. Thus, from the point of view of paternalistic society, tax distortions which lead to the decrease of cigarette consumption are desirable. However, this may be vice versa from the point of view of tax revenue collection.

In order to examine the issue of tax revenue, we will use simple mathematical representation. Under
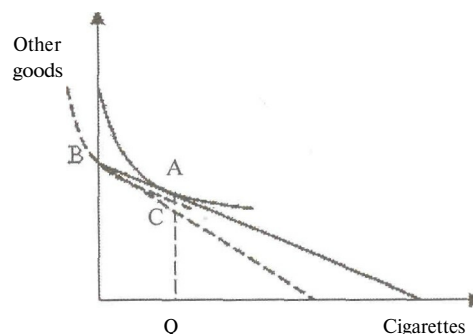
Graph 3. Case of quit smoking

new excise tax system the collected tax revenue equals:

$$TR = T_F Q_F + t P_F Q_F + T_{NF} Q_{NF} + t P_{NF} Q_{NF}, \quad (1)$$

where *TR* - a tax revenue, $P_{F/NF}$ – price of filter/non-filter cigarettes, $Q_{F/NF}$ – quantity of filter/non-filter cigarettes (for simplicity assume that quantity produced equals quantity consumed), $T_{F/NF}$ – a specific tax on filter/non-filter cigarettes, *t* - ad valorem tax (in our case 0.05 or 5 %). Assuming that α, β, γ are shares of non-filter cigarettes consumed by low, middle, high income individuals ($0 \leq \alpha / \beta / \gamma \leq 1$), formula (1) transforms as follows:

$$TR = (T_F + t P_F) Q_F + (T_{NF} + t P_{NF}) Q_{NF} =$$
$$= (T_F + t P_F)\left((1-\alpha)Q^L + (1-\beta)Q^m + (1-\gamma)Q^h\right) +$$
$$+ (T_{NF} + t P_{NF})\left(\alpha Q^L + \beta Q^m + \gamma Q^h\right). \quad (2)$$

From the expression (2) we can obviously see that the higher the tax rates, price and quantity of cigarettes consumed by all types of consumers the higher the tax revenue. However, as we have discussed above, an increase in the tax rates can lead to some decrease in consumption of cigarettes in general but most likely (and to a greater extent since substitution within types of cigarettes is much higher than between cigarettes and other goods) to the increase in the share of non-filter cigarettes. An increase in the share of non-filter cigarettes may, in turn, significantly decrease the tax revenue below otherwise expected. This effect, in particular, can be seen from the following derivations:

$$\frac{\partial TR}{\partial \alpha} = Q^L\left[(T_{NF} - T_F) + t(P_{NF} - P_F)\right] < 0 \quad (3)$$

$$\frac{\partial TR}{\partial \beta} = Q^m\left[(T_{NF} - T_F) + t(P_{NF} - P_F)\right] < 0 \quad (4)$$

$$\frac{\partial TR}{\partial \gamma} = Q^h\left[(T_{NF} - T_F) + t(P_{NF} - P_F)\right] < 0 \quad (5)$$

$$TR = TR(\alpha, \beta, \gamma, Q^L, Q^m, Q^h, T_F, T_{NF}, t, P_F, P_{NF}) \quad (6)$$
$$\quad - \ - \ - \ + \ + \ + \ + \ + \ + \ + \ +$$

To sum up it briefly and to the point, the introduction of the above stated mixed excise tax system can result in the following effects. First, the absolute prices of cigarettes are going to rise, which reduces the welfare of smokers and may also slightly cut the consumption of cigarettes by weakly-addicted individuals. Second, filter cigarettes are going to become more expensive relative to non-filter, which can lead to the substitution within the types of cigarettes in favour of non-filter ones and thus result in the additional distortion. Finally, an increase in the share of non-filter cigarettes can significantly reduce

the tax revenue otherwise expected due to the decrease in both specific and ad valorem part of tax revenue.

Conclusion

The overall assessment of the changes in the tobacco excise tax policy depends on the position to which we will adhere.

From the efficiency standpoint, the new tax could be both positive and negative. On the one hand, this tax can increase efficiency by correcting negative externality. On the other hand due to the low elasticity of demand on cigarettes, the correction might be small, though the distortion may also be small. However, if we consider the substitution between filter and non-filter cigarettes rather than between cigarettes and other goods, then distortion could be quite big since some groups of individuals could partly avoid taxes by changing their consumption pattern.

From the equity standpoint, the partial change to the ad valorem tax could decrease the regressivity of the tobacco tax (Stiglitz, 2000) since those cigarettes which are prefered by high income individuals (filter) become relatively more expensive; hence such change is justified by the vertical equity considerations. Moreover, the ad valorem component appears to make tobacco tax more flexible (e. g. it will automatically adjust tax revenue to inflation).

There are also clearly negative aspects of this tobacco tax. First, it does not justify the transparency requirements of the tax system: though legally tax falls on the producers of cigarettes, given the monopolistic structure of the market and low elasticity of demand the actual burden is borne by consumers. Second, the design of the ad valorem tax (depends on the maximum retail price) makes it administratively difficult to collect and gives a lot of room for the shadow operations. Third, as discussed above, the introduction of the new tax will decrease the welfare of smokers (however it may seem to be vice versa from the point of view of paternalistic society and merit argument). Finally, this tax appears to have a behavioral effect in the form of the smoking decision and can lead to the unexpectedly low tax revenue if there is a significant substitution effect within the types of cigarettes.

In general the tobacco tax seems to be one of the desireable taxes from the point of view of optimal taxation. This is due to the fact that it allows to raise tax revenue with the minimal dead weight losses for the society and can even slightly correct the market failure (recall merit and externality argument). In addition, the introduction of the ad

valorem component improves the regressivity problem of the tax and make it more flexible. However, the government should make a realistic estimation of the tax revenue and not to overlook the substitution effect between types of cigarettes and the possible change in the demand structure. It is also reasonable to keep a closer watch for the monopolization of the industry and tax collection process in order to avoid smuggling and other shadow operations, but this is another story.

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АКЦИЗ НА ТЮТЮНОВІ ВИРОБИ В УКРАЇНІ: АНАЛІЗ НОВОВВЕДЕНЬ

У статті аналізується податкова політика щодо тютюнових виробів в Україні. Особливу увагу приділено можливим ефектам зміни акцизного податку на тютюнові вироби на структуру ринкового попиту. Аналіз еластичності попиту різних груп населення доповнює дослідження.