

Achieving Tobacco Control Policy Goals in Ukraine via Economic Tools

Draft Research Paper

August, 2003

Maksym Mashlyakivskyy (Ukraine)

2003-2004 International Policy Fellow (OSI-Budapest)

Tobacco Economics Research and Advocacy

E-mail: mashlyakivskyy@policy.hu

1. Table of Contents

1. Table of Contents	2
2. List of Figures and Tables	3
3. Introduction	4
4. Research Framework.....	5
4.1. Goal.....	5
4.2. Tobacco control tools	5
4.3. Approach	5
4.4. Logic of the analysis	6
5. Smoking and Health in Ukraine	7
6. Tools: Taxation.....	8
6.1. Overview.....	8
6.2. Effectiveness of the Tool Usage in Ukraine	8
6.3. Achieving the Goal.....	12
6.4. Policy Options	12
7. Tools: Advertising Restrictions/Bans	16
7.1. Overview.....	16
7.2. Effectiveness of the Tool Usage in Ukraine	16
8. Appendix 1. Estimated Econometric Model of Tobacco Market in Ukraine	18

2. List of Figures and Tables

Figure 1. Cigarette prices vs. excise tax.....	8
Figure 2. Domestic cigarette production	9
Figure 3. Cigarette exports and imports	9
Figure 4. Legal domestic sales of cigarettes in Ukraine	10
Figure 5. Legal domestic sales of cigarettes and excise taxation (1997-2002)	10
Figure 6. Estimate of total cigarette consumption in Ukraine	11
Figure 7. Employment in tobacco industry.....	12
Figure 8. Indices of employment and production, 1998=100.....	12
Figure 9. Excise rates in Ukraine and Russia (1997-2002)	13
Figure 10. Dynamics of cigarette price and excise tax	14
Figure 11. Out-door tobacco advertising expenditures, 1999-2001, thousands USD per month	17

3. Introduction

This research is done in the framework of the International Policy Fellowship Program (IPF-Budapest) financed by the Open Society Institute (OSI). The research field is tobacco control economics while the analysis is primarily focused on Ukraine. The main objectives of the research are as follows:

- To analyze tobacco control in Ukraine and evaluate the effectiveness of existing tobacco control policy;
- To analyze international experience in applying economic tobacco control tools;
- To conduct economic modeling of Ukraine's tobacco market, determine the most effective tools for tobacco control in Ukraine and evaluate their impact;
- To develop tobacco control policy recommendations for the Ukrainian government.

Note, that this is an interim report and all analysis is preliminary. Therefore, some sections are not fully elaborated. New data and analysis will be included at the second stage of the research project. The structure and content of the report may change at the stage of the final report preparation.

4. Research Framework

4.1. Goal

This research is devoted to analysis of different tobacco control tools and their effective utilization in Ukraine. While conducting the analysis, I considered the primary goal of the tobacco control policy, namely reducing consumption of tobacco products and smoking prevalence.

However, in Ukraine, the government defines another priority of tobacco taxation (one of the most effective tobacco control tools) – raising tax revenues. This issue is also analyzed in this research. The reason for doing so is the fact that the government is likely to be extremely sensitive to the revenue issue. Therefore, proper analysis of the fiscal outcomes of the tobacco control policy may be more convincing for the government.

4.2. Tobacco control tools

In general, I single-out the following major tobacco control tools:

- Taxation;
- Advertising and sponsorship restrictions/bans;
- Restrictions/bans on smoking in public places.

All these tools are analyzed further in this report¹.

4.3. Approach

This research is an attempt to analyze tobacco control in Ukraine from the economic perspective. The analysis is built on the fact that all tobacco control tools aim at influencing incentives and/or behavior of final consumers. For instance, tobacco taxation aims at making tobacco products more expensive for consumers who are expected to reduce their consumption given their limited incomes. Advertising bans are expected to eliminate tobacco industry's influence on current and potential consumers' behavior.

¹ Some of the analysis is not ready yet. This will be finished at the stage of the final report preparation.

Therefore, we are particularly interested in knowing the reaction of current and potential consumers to the implementation of different tobacco control tools. Consequently, the analysis is primarily focused on the demand side of the tobacco market. In some cases, the supply side is analyzed as well.

4.4. Logic of the analysis

The analysis will start with evaluation of smoking prevalence and smoking patterns in Ukraine. This includes analysis of different smoker groups, impact of smoking on their health, and dependence between smoking status and socio-demographic factors. This section will be mainly based on 2002 nationwide household survey conducted by the State Statistics Committee of Ukraine. For the first time in 2002, the survey contained a special section devoted to smoking and health of Ukrainians.

After that, each section is devoted to analysis of a particular tobacco control tool. Currently, in the interim report, not all sections are completed and not all tools are analyzed.

First, a general overview of a policy tool is provided.

Second, I analyze how the tool was used in Ukraine in previous years. This is supplemented with evaluation of the policy's effectiveness in terms of reducing tobacco consumption and, where applicable, with estimates of its impact on government revenues.

Third, I provide analysis of how the tool should be used effectively in order to achieve the primary tobacco control goal. This is done on the basis of available data for Ukraine and/or on the basis of international data.

Fourth, I analyze different policy options. This includes analysis of the impact of different policy decisions on agents involved. Depending on the tool, the list of agents is determined. Where possible, the effect is quantified. Where applicable, the issue of smuggling is taken into consideration.

Finally, policy recommendations will be elaborated.

5. Smoking and Health in Ukraine

According to 2002 nation-wide household survey conducted by the State Statistics Committee of Ukraine, 23.3% of Ukrainians are smokers. This was calculated as a percentage of those aged 15+. Compared to many other countries, the share of smokers in Ukraine may seem rather moderate. However, some dangerous trends are observed in Ukraine.

On average, a Ukrainian smoker smokes about 14 cigarettes, which is rather large amount. The average period of being a smoker is 19.5 years. Such a long average period together with the large average daily smoking indicates that many of Ukrainian smokers are people with strong smoking habit and addiction. Therefore, they are hardly influenced by the tobacco control measures as it is difficult for them to reduce or quit smoking. Particularly, as shown further in this report, the price elasticity of the demand for tobacco is relatively small for Ukraine indicating low responsiveness of smokers to cigarette price changes.

Another characteristic of Ukrainian smokers is a relatively large number of people starting smoking in these years. This fact is supported by the results of the survey. For instance, over 17% of all smokers are people who started smoking no more than 5 years ago. The share of smokers who started smoking in 2001 (or one year before the survey) approaches 3%. All these facts seem to indicate that recently, the tobacco industry has been successful in attracting new consumers. Therefore, cigarette consumption and smoking prevalence are likely to grow further in the nearest future.

To sum up, given the characteristics of Ukrainian smokers, we can conclude that if the government wants to reduce tobacco consumption, strong tobacco control measures should be implemented. Otherwise, it would be impossible to influence smokers' behavior.

6. Tools: Taxation

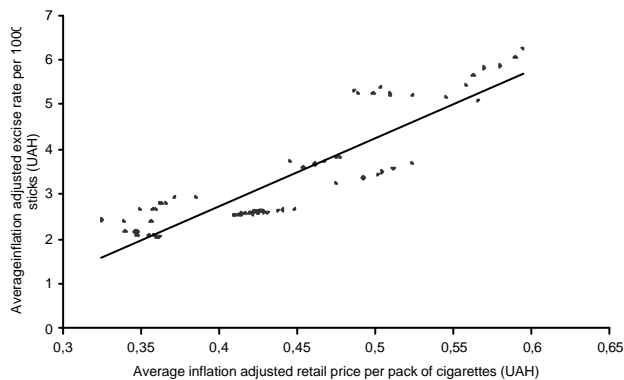
6.1. Overview

Tobacco taxation is considered to be one of the most effective tools allowing to reduce tobacco consumption. Changes in taxation levels have direct impact on the price of cigarettes. The tool is especially powerful for lower-income countries where people are more sensitive to price changes given their low incomes. Therefore, the price elasticity of demand for cigarettes tends to be higher in such countries. Consequently, even small increases in the taxation level allow for notable decreases in tobacco consumption.

6.2. Effectiveness of the Tool Usage in Ukraine

Taxation is one of the few tobacco control tools used in Ukraine. Not surprisingly, the tool allows to reduce cigarette consumption in Ukraine. This is shown in the following figures. Based on the 1997-2002 monthly data, figure 1 illustrates the interdependence between the cigarette excise tax level and the average cigarette price. As the figure reveals, there is a strong positive relationship between the two variables. This means that the tobacco companies shift at least part of the excise tax on consumers.

Figure 1. Cigarette prices vs. excise tax



Source: State Statistics Committee, Ukrainian Law, own calculations.

6.2.1. Cigarette Demand in Ukraine

Since reliable estimates of total cigarette consumption are missing in Ukraine, I will first analyze dynamics of legal cigarette sales.

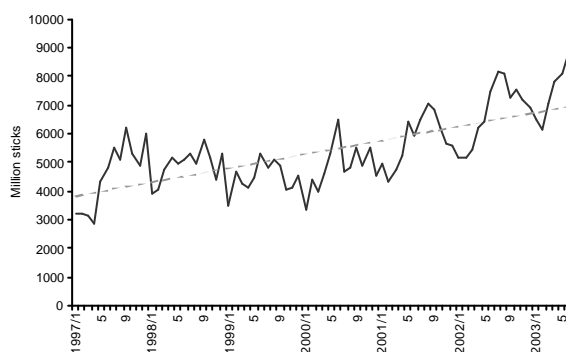
Four multinational companies are the major market players. These are Philip Morris, BAT, JTI, and Reemtsma. Each company has its factory in Ukraine. The companies

entered Ukraine's market in 1993-1994 mainly through buying-out old soviet tobacco factories. Despite this, in this research, we analyze data mainly for the period from 1997 till 2002, as prior to 1997 the tobacco companies had been modernizing old factories and developing their production capacities.

Figure 2 shows the data for monthly production of cigarettes in Ukraine for the period from January 1997 till June 2003. It is clear from the figure that some seasonality is present in cigarette production, namely production is lower at the beginning and at the end of each year. However, as the trend line reveals, cigarette production in Ukraine is constantly growing despite some monthly fluctuations.

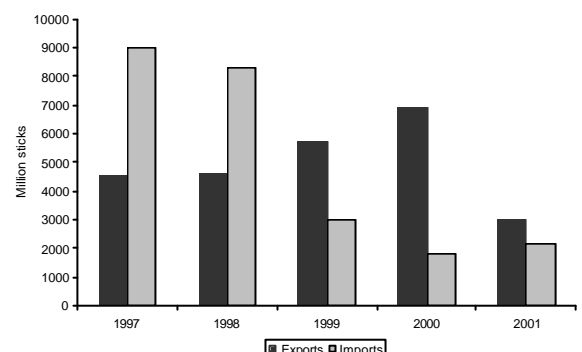
Figure 3 reflects the other type of domestic companies' activities, i.e. external trade. Starting 1999, Ukraine became a net exporter of cigarettes majority of which is sold to the former Soviet Union countries.

Figure 2. Domestic cigarette production



Source: State Statistics Committee, own calculations.

Figure 3. Cigarette exports and imports

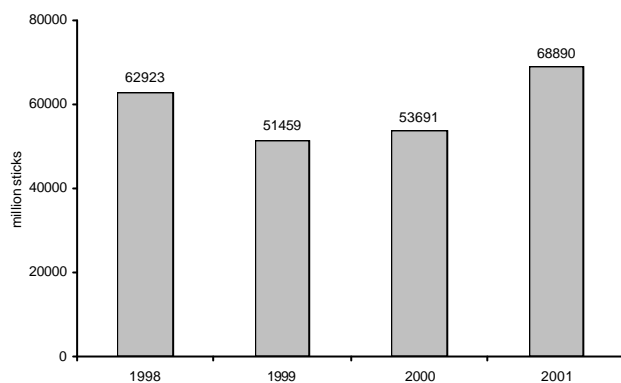


Source: State Statistics Committee, own calculations.

The share of exports in total production is not significant. According to 2001 data, cigarette exports accounted for only 4.3% of the production volume. Despite the fact that an increase in exports was accompanied by declining imports (1997-2000), we can conclude that legal domestic cigarette consumption is growing in Ukraine. Figure 4 illustrates this point. A fall in legal domestic sales was observed in 1999 which was mainly caused by increased excise rates and growing illegal imports².

² The issue of smuggling is analyzed further in this report.

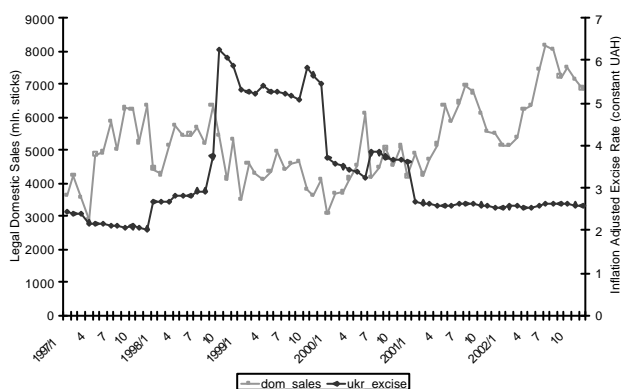
Figure 4. Legal domestic sales of cigarettes in Ukraine



Source: State Statistics Committee, own calculations

Finally, figure 5 illustrates the other dependence: legal domestic sales of cigarettes versus the excise rate. It is clear from the chart that higher excise rates tend to decrease legal cigarette consumption in Ukraine³. However, the question remains: What is the influence of higher taxes on total (legal + illegal) consumption?

Figure 5. Legal domestic sales of cigarettes and excise taxation (1997-2002)



Source: State Statistics Committee, Ukrainian Law, own calculations.

In order to answer this question, I will try to evaluate the total consumption using the estimated econometric model of the tobacco market. The major simplifying assumptions of such evaluation are as follows:

- Cigarette demand is satisfied from the two sources: legal sales and smuggling;

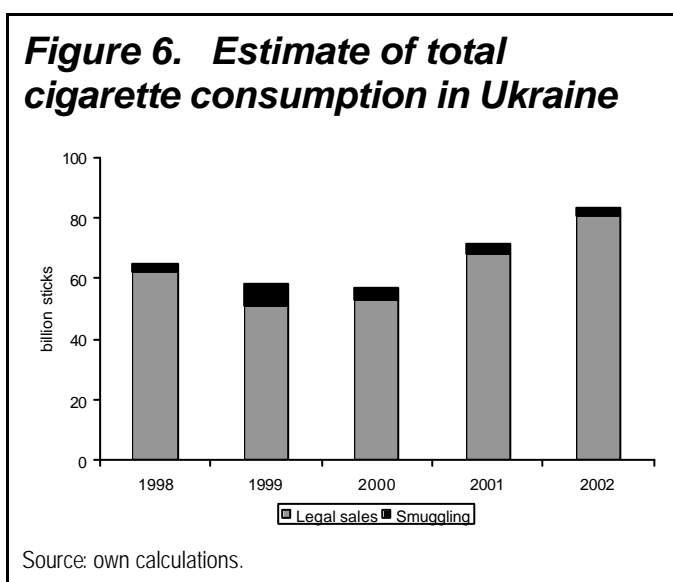
³ The issue of cigarette smuggling is analysed further in this report.

- Majority of smuggled cigarettes originate in Russia;
- The major cause of smuggling is the excise tax differentials between Ukraine and Russia;
- The price elasticity of cigarette demand is the same for smokers consuming legal and illegal tobacco products.

The approach to estimating total cigarette demand is the following. Here, the major problem is to estimate the volume of smuggling.

In order to estimate the volume of smuggling, in the econometric model, I will hypothetically “increase” the Russian excise rate up to the level of Ukraine. This allows us to evaluate how many cigarettes are consumed by smokers who currently buy smuggled products but if the Russian tax is increased would switch to legal products (first component).

The second step is to calculate by how much smokers currently consuming illegal products would hypothetically reduce their consumption if the Russian excise rate is increased up to the level of the Ukrainian excise. This is done using the estimated price elasticity and relationship between the excise rate and the price. Then, this amount is added to the first component calculated on the first step. In such a way, an estimate of the volume of smuggling is received. After that, I add up legal domestic sales and the estimated volume of smuggling (see Figure 6).



As we see from the figure above, starting 2001, cigarette consumption has been growing in Ukraine at a rather high annual rate. At the same time, my estimates show that in the period of higher taxes (1999-2000, see figure 5), total cigarette consumption

decreased despite the growth in the volume of smuggling. Therefore, we may conclude that in terms of the primary tobacco control goal (reducing cigarette consumption), the taxation tool is not used effectively as the current policy does not stimulate consumers to reduce cigarette consumption. At the same time, as the analysis reveals, the tool is powerful in reducing smoking in Ukraine.

6.3. Achieving the Goal

As the analysis above and the econometric model show, there is a need to increase tobacco taxes in Ukraine. This will both reduce cigarette consumption and increase government revenues from VAT and excise tax on tobacco products. While preparing the final research report, the excise rate providing maximum revenues from VAT and excise tax will be calculated based on the econometric model estimated.

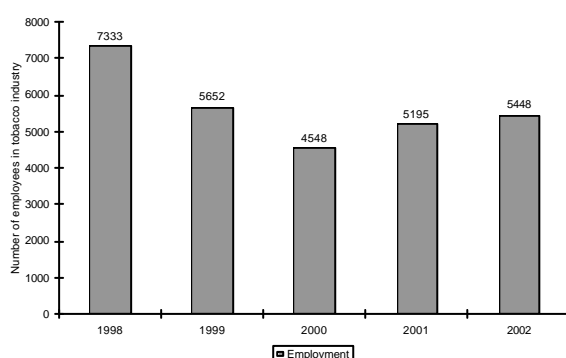
6.4. Policy Options

While preparing the final report, I will consider some policy options and analyze their consequences for smokers and the government – the major parties affected by the taxation policy. However, any changes in tobacco taxation are expected to influence two particular areas where the effect of such policy is not clear enough. The areas are employment in the tobacco industry and smuggling. These are analyzed below.

6.4.1. Employment

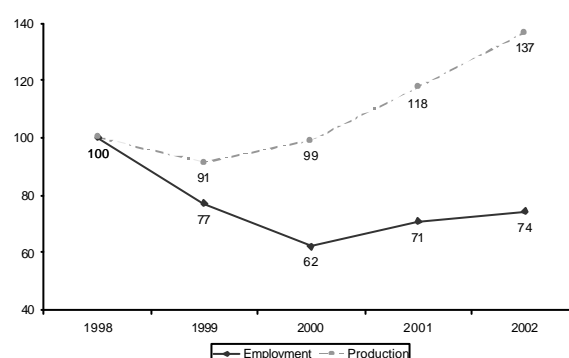
It is often claimed that the tobacco industry is an important employer for the domestic economy. Moreover, the industry claims that tobacco control measures (and taxation in particular) will reduce the industry output and therefore, they will be forced to lay out their workers.

Figure 7. Employment in tobacco industry



Source: State Statistics Committee, own calculations.

Figure 8. Indices of employment and production, 1998=100



Source: State Statistics Committee, own calculations.

Figure 8 plots the two data series, namely, tobacco industry output and total employment in the industry⁴. For the ease of comparison, the data is expressed in the form of indices where both of them were set equal to 100 in 1998. As we can see, there is no strict relationship between the two indicators. For instance, in 2000, the production volume increased as compared to 1999, while employment dropped significantly. In general, if we compare 1998 and 2002, we can conclude that while cigarette production increased by 37%, employment in the industry declined by more than a quarter.

Therefore, based on the data analyzed, we cannot predict the employment effect of reduced (increased) cigarette production as this seems to be determined by the tobacco companies' employment policy and changes in technologies used in cigarette production.

6.4.2. Smuggling

The peculiarity of the Ukrainian cigarette market is the availability of cheaper smuggled cigarettes. Of course, this has a direct impact on tobacco control efforts of the government.



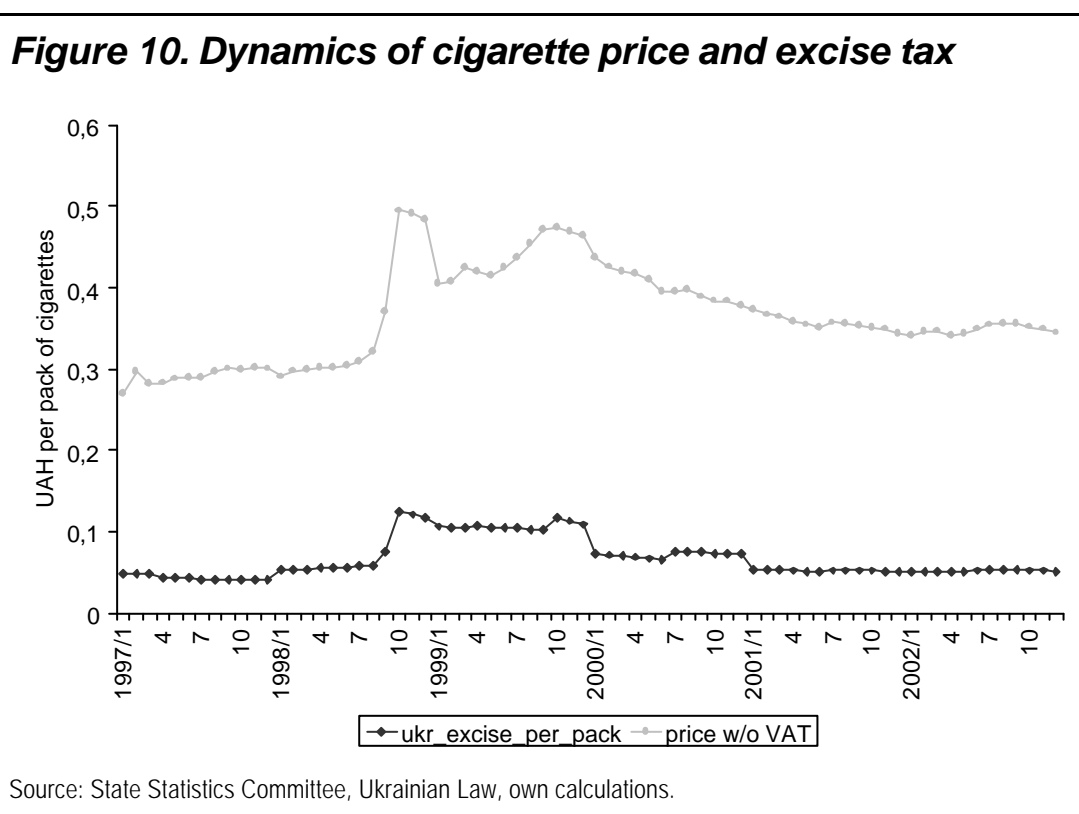
It is often claimed that majority of smuggled cigarettes is brought from Russia and Moldova. Among the major causes of smuggling, the industry and many experts claim the difference in the taxation levels in Ukraine and its neighboring countries. This is

⁴ The numbers for the industry employment include only workers involved in cigarette manufacturing. Therefore, tobacco farmers and workers engaged in primary tobacco processing are not taken into account.

depicted in the figure above. Indeed, sales of smuggled cigarettes increased dramatically in the period of large tax differentials (1999-2000).

At the same time, the estimated econometric model of Ukraine's tobacco market (see Appendix 1) indicates that a 10% increase in the Ukrainian excise rate will lead to at most 1% drop in legal domestic sales due to increased smuggling. The model seems to underestimate the volume of smuggling or smuggling is not caused entirely by the tax differentials.

In this regard, an additional point needs to be carefully analyzed, namely the fact that smugglers are driven by the cigarette price differentials – not the tax differentials themselves. Figure 10 shows the dynamics of the cigarette excise taxes and prices in Ukraine. Both data series were inflation adjusted and expressed in terms of the amount per one pack of cigarettes. In addition, the VAT was subtracted from the average price allowing for more accurate comparisons.



The period from the end of 1998 till the end of 1999 is particularly interesting in this regard. In September 1998, there was a relatively significant tax increase. In the

following several months, the tax increased further due to devaluation of Hryvnia with respect to EURO⁵ which was caused by the financial crisis.

What we observed was the tax increase of 0.06 UAH per one pack of cigarettes (from 0.06 UAH in August up to 0.12 UAH in October 1998). However, during the same period, the average price of a cigarette pack increased by 0.18 UAH (from 0.32 UAH in August up to 0.5 UAH in October), which was 3 times more compared to the tax increase.

Another interesting point is the price increase starting June 1999. Until October, the price increase was not caused by any changes in taxation. Therefore, the increase was a part of the tobacco companies' price policy. At the same time, the press released a lot of articles exploring the topic of cigarette smuggling and its causes (namely, high tax rates in Ukraine). The large-scale mass-media campaign and the industry's price policy had their results. All this made the government to decrease tobacco taxes starting from January 2000.

Starting January 2000, cigarette prices have been gradually decreasing in Ukraine. While from that time, the cigarette tax decreased by about 0.02 UAH per one pack, the average price declined by approximately 0.1 UAH. As a result, cigarette consumption has been growing in Ukraine (analyzed further in this report).

The following conclusions can be drawn from the above analysis:

- Growing smuggling was at least partially caused by the tobacco companies' price policy.
- The industry was successful in lobbying tax decreases in particular using the price policy.
- Cigarette production in Ukraine is becoming more efficient and/or tobacco companies earn significant profits – all this allowing the industry to decrease cigarette prices while stimulating an increase in demand.

⁵ In those times, Ukraine had a specific excise tax expressed in Euros per 1000 sticks.

7. Tools: Advertising Restrictions/Bans

7.1. Overview

Advertising restrictions/bans are regarded to be effective tools for reducing tobacco consumption. However, implementation of this tool affects a larger number of agents who may oppose to such a policy. Besides the government receiving revenues from taxes on advertising, the advertising industry itself is likely to oppose such a policy. Therefore, a proper analysis of the policy's outcomes is needed or otherwise it will not be accepted.

7.2. Effectiveness of the Tool Usage in Ukraine

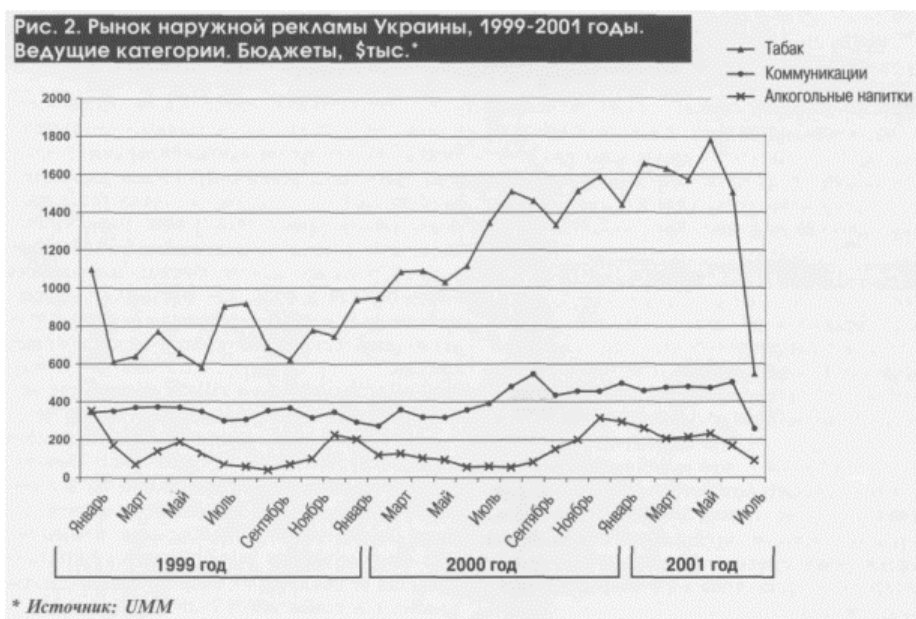
Until present, Ukraine has enjoyed at least some restrictions on tobacco advertising. In particular, there is a complete ban on TV and radio advertising of tobacco products. However, advertising in printed mass-media and out-door advertising is not prohibited. Consequently, according to the Ukrainian Media Monitor, the tobacco companies are at the top of the list of the largest advertisers using both types of advertising. Moreover, if we consider out-door advertising, cigarettes are the most heavily advertised good both in terms of the number of advertisements and in terms of the amounts spent.

The figure 11 illustrates the dynamics of out-door tobacco advertising expenditures in Ukraine. This is monthly data for the period from January 1999 till July 2001. The advertising budgets are expressed in thousands USD. As we can see from the graph, tobacco is the most heavily advertised good (the upper line in the graph).

Moreover, over the period under consideration, tobacco advertising expenditures have been growing. Therefore, at least a part of the increase in legal domestic sales may be attributed to increased advertising expenditures. A gradual decline in cigarette prices accompanied by the increased advertising expenditures had its effect: cigarette sales started growing (see above).

The issue of advertising will be further elaborated in the final research report.

Figure 11. Out-door tobacco advertising expenditures, 1999-2001, thousands USD per month



Source: Ukrainian Media Monitor.

Note: the three lines in the graph correspond to three goods with the largest advertising budgets: tobacco (the upper line), telecommunications (the line in the middle), and alcoholic drinks (the lower line).

8. Appendix 1. Estimated Econometric Model of Tobacco Market in Ukraine

The model consists of three equations estimated simultaneously: demand curve, price equation, and the Laffer curve reflecting the relationship between the tax revenues and different factors affecting the revenues. The three equations describe Ukraine's tobacco market. All coefficients (except for the intercept in the third equation) are significant at least at the 10% significance level. Majority of the coefficients is significant even at the 1% significance level.

At the stage of the final report preparation, I expect to introduce new variables in this model (e.g. tax rates in Poland – in order to try to estimate the volume of smuggling from Ukraine to other countries). Therefore, the estimated model should not be regarded as a final version.

Estimation Method: Seemingly Unrelated Regression

Sample: 1997:02 2002:12

Included observations: 71

Total system (unbalanced) observations 205

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	3.792239	0.530396	7.149820	0.0000
C(2)	-0.271105	0.126275	-2.146946	0.0331
C(3)	0.300884	0.049849	6.035939	0.0000
C(5)	-0.060777	0.035904	-1.692783	0.0921
C(8)	0.253643	0.066362	3.822124	0.0002
C(10)	-1.335144	0.302234	-4.417587	0.0000
C(11)	0.202198	0.037421	5.403255	0.0000
C(12)	0.156666	0.043384	3.611119	0.0004
C(13)	0.541071	0.085571	6.323060	0.0000
C(14)	-0.075524	0.044105	-1.712376	0.0885
C(20)	-2.345098	8.439451	-0.277873	0.7814
C(22)	7.529391	3.810172	1.976129	0.0496
C(27)	3.536427	1.562234	2.263698	0.0247
C(23)	0.856576	0.125761	6.811138	0.0000
C(25)	-1.196007	0.446622	-2.677893	0.0081
C(26)	0.003951	0.000569	6.941798	0.0000
Determinant residual covariance		9.85E-05		

Equation: $\text{LOG}(\text{DOM_SALSA}) = \text{C}(1) + \text{C}(2) * \text{LOG}(\text{PRICESA}) + \text{C}(3)$

$* \text{LOG}(\text{HISA}) + \text{C}(5) * (\text{LOG}(\text{UKR_EXCISE}(-1)) - \text{LOG}(\text{RUS_EXCISE}(-1)))$

$$-5)) + C(8) * \text{LOG}(\text{DOM_SALSA}(-2))$$

Observations: 67

R-squared	0.764108	Mean dependent var	8.546137
Adjusted R-squared	0.748889	S.D. dependent var	0.185469
S.E. of regression	0.092940	Sum squared resid	0.535548
Durbin-Watson stat	1.915925		

$$\begin{aligned} \text{Equation: } \text{LOG}(\text{PRICESA}) = & C(10) + C(11) * \text{LOG}(\text{UKR_EXCISE}) + C(12) \\ & * \text{LOG}(\text{USD}) + C(13) * \text{LOG}(\text{PRICESA}(-1)) + C(14) \\ & * \text{LOG}(\text{UKR_EXCISE}(-1)) \end{aligned}$$

Observations: 71

R-squared	0.954665	Mean dependent var	-0.832284
Adjusted R-squared	0.951918	S.D. dependent var	0.150913
S.E. of regression	0.033092	Sum squared resid	0.072274
Durbin-Watson stat	1.363287		

Equation:

$$\begin{aligned} \text{REV} = & C(20) + C(22) * \text{UKR_EXCISE}(-1) + C(27) \\ & * \text{RUS_EXCISE}(-5) + C(23) * \text{UKR_EXCISE}^2 + C(25) * \text{UKR_EXCISE}(-1)^2 + C(26) * \text{HISA} \end{aligned}$$

Observations: 67

R-squared	0.638147	Mean dependent var	36.72017
Adjusted R-squared	0.608487	S.D. dependent var	7.788205
S.E. of regression	4.873159	Sum squared resid	1448.608
Durbin-Watson stat	1.402276		

Explanation of variables:

DOM_SALES – legal domestic sales of cigarettes, thousands sticks.

DOM_SALSA – seasonally adjusted legal domestic sales. This is introduced in the model both as a dependent variable and independent variable, the latter reflecting the assumption of consumers' myopic behavior.

PRICESA – seasonally adjusted average cigarette price, inflation-adjusted UAH per pack.

HISA – seasonally adjusted real household incomes, million UAH. This indicator reflects overall changes in the well-being of Ukrainians.

UKR_EXCISE – inflation-adjusted average cigarette excise rate in Ukraine, UAH per 1000 sticks.

RUS_EXCISE – inflation-adjusted average cigarette excise rate in Russia, expressed in UAH per 1000 sticks. Another variable – the difference between the Ukrainian and Russian excise rates – is introduced in the model to reflect the economic incentive to smuggle from Russia to Ukraine. Having introduced this variable, we can obtain an unbiased estimate of the price elasticity and evaluate how much additional smuggling is caused by changes in the tax differential.

USD – real exchange rate of Hryvnia with respect to the US dollar. This variable was introduced mainly as a proxy for the missing data on the price of raw tobacco used in cigarette production. Since the majority of raw tobacco is imported to Ukraine, the exchange rate can be a good proxy for the raw tobacco price if we assume that the world price of tobacco did not change significantly over the period under consideration.

REV – government revenues from VAT and excise taxation of tobacco products, thousands inflation-adjusted Hryvnia.