# EXAMINATION OF THE ECONOMY OF TOBACCO - GROWING IN UKRAINE

by

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A thesis submitted in partial fulfillment
of the requirements for the degree of

Master of Arts in Economics

National University of "Kyiv-Mohila Academy"

2001

Approved by _____
Chairperson of Supervisory Committee

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Program Authorized
to Offer Degree _____

Date _____

National University of “Kyiv-Mohila

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Abstract

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The main purpose of this thesis is an examination of tobacco-growing industry of Ukraine. The question under consideration is what impact would have the new law on stimulating the development of agriculture, which implements 10% content requirement of Ukrainian tobacco usage, on the industry. For achieving this goal possible changes in supply and demand of raw tobacco are considered and partial equilibrium analysis is made.

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## ACKNOWLEDGMENTS

I would like to express my gratitude to my thesis advisor Prof. Gene Ellis for his assistance and guidance. I am also grateful to Maksym Mashlyakivskyy for his help in acquiring data and literature. I want to thank also to the Prof. David Snelbecker, Prof. Jerzy Konieczny, and Prof. Roy Gardner for their valuable comments and suggestions.

*Chapter 1*

# INTRODUCTION

For a long period of time Ukraine has been known as an agricultural country. This specialization occurred due to its climate conditions, fertile soil and favorable geographical position. The main products of Ukrainian agriculture are wheat, sugar, sunflowers, but there are some other crops, which can be successfully grown and give even greater benefits.

One of such crops is tobacco, which is the world's most widely grown non-food crop, produced on all six continents in more than one hundred countries. Tobacco leaf production reached about 6.388 million tones (greenweight) in 1993, an increase of nearly 40 per cent since 1987. Year by year technology of tobacco growing improves and productivity rises. In year 1999 tobacco leaf occupied the area of about 0.3 per cent of all arable land world-wide, less than half that under coffee, for example, but amount of money running in the trade of tobacco leaf worldwide is about $19 billion per year (International Tobacco Growers Association, 2000)

For the farmers, tobacco is one of the most stable short-term cash crops. Net returns per hectare are generally several times greater that those obtained from industrial crops such as cotton and sugar, as well as from cereals and other staple foodstuffs. Other crops can be successfully grown in a rotation with tobacco (International Tobacco Growers Association, 2000).

Tobacco's relative price stability is another point in its favor. UNCTAD figures show that over the ten years to 1993 tobacco prices were more stable

than for any of 30 or so other agricultural commodities, with the exception of beef. Its price stability exceeded that of sugar, tea and wheat by factors of roughly four, three and two, respectively. Looking ahead, the World Bank forecasts that while maize prices are likely to rise 15 per cent by 2005, the price of tobacco is projected to rise by 21 per cent (International Tobacco Growers Association, 2000).

The major reason for increase of tobacco cultivation in Ukraine is high demand for cigarette production. Tobacco leaf demand for Ukrainian cigarette production is now about 50 thousands tones per year and Ukrainian farmers produce about 10% of this amount – 5.5 thousand tones per year (Derzhkomstat, 2000). The question arises is whether farmers just can't grow tobacco because of physical reasons- lack of land, unsuitable weather conditions and so on. This sounds reasonable, but till 1991 Ukraine's volume production of tobacco was about 12 thousand tones. Furthermore, in 1970th Ukraine produced about 30 thousand tones per year, but planning policy of the Soviet government allocated tobacco-growing industry to the Southern republics such as Kazakhstan, Kirgizstan, Turkmenistan, which are playing the major role at the former USSR tobacco market now, and so tobacco production in Ukraine declined.

On the January 18, 2001 the Verkhovna Rada adopted the law "On Stimulating the Development of Agriculture for the 2001 – 2004 Period", which implements procedure for obligatory use of domestic tobacco raw materials in the amount of not less than 10 percent of the total requirements of cigarettes producers. Among others Chapter 2 of the Law " Basics of cooperation between state authorities and agricultural producers" states that :

" Foreground development of the agriculture is provided by the way of:

promotion of extension of national raw material base for production of the tobacco products, by implementation of the obligatory usage of Ukrainian grown and fermented raw tobacco in the national unlicensed cigarettes brands, protected by the mark for Ukrainian products."

This law enforces protection of the Ukrainian raw tobacco producers and represents the regulatory intervention of the Ukrainian government, while world economies tend to deregulation.

In my thesis I would like to consider what impact would implementation of such a law have on Ukrainian economy. Would it increase or decrease welfare? For estimating the effects of the law implementation estimation of possible changes in demand and supply of raw tobacco is made and changes in market structure are analyzed.

It is found that the law adoption would increase raw tobacco production in Ukraine only after several years. In the meantime, Swiss-Russian-Ukrainian JSC "Tiutiun Impex" would gain monopoly power end receive extra profits. It should be noticed, that only a part of such profits will stay in Ukraine, larger share would be received by Russian and Swiss partners. Also possible respond strategies of the cigarettes producers are constructed.

Although, economic consequences of the new law would be presented further the following legal ones have already appeared:

The Law contradicts Articles 13 and 42 of Ukrainian constitution, which stipulate for the state protection of all subjects to property rights and state defense of competition in business activity.

The Law contradicts article 15 of Agreement on Partnership and Cooperation of Ukraine with European Communities, Article 3 of General Agreement on

tariffs and trade and will not promote Ukrainian integration to the European and world communities.

The Law is a threat to the technologies and recipes of cigarette production, which are subject to intellectual property of producer and are created in the highly competitive environment, aiming satisfaction of high demands of consumers.

The Law would be discriminative to legal producers and would negatively influence competitiveness of domestic tobacco products. (“Ukrtiutiun” Association, 2001).

*Chapter 2*

# THE UKRAINIAN TOBACCO INDUSTRY.

In year 2000 tobacco production in Ukraine amounted to 5,623 tons, which is slightly less than in 1999, but is still a significant amount for the Ukrainian tobacco- growing industry (table 1). This decrease in volume production can be explained by the current restructuring of the raw tobacco market, which is discussed below. The volume of tobacco produced domestically is not sufficient for satisfying the needs of cigarettes producers (e.g. in 1999 58,806 mln sticks of cigarettes were produced which equals to the 49,320 tons of tobacco needed), so Ukraine is net importer of tobacco and its share in world imports is about 2-2.5%. (Derzhkomstat)

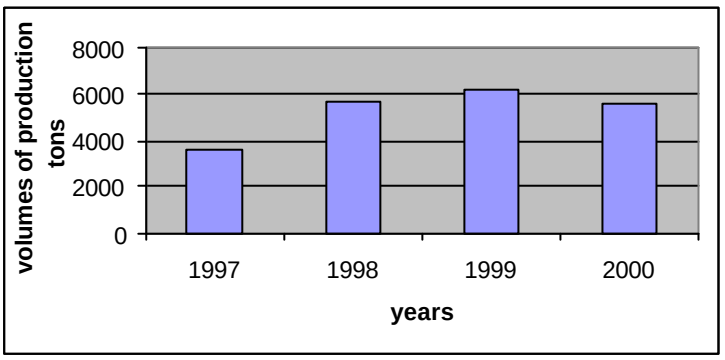



Table 1 (Derzhkomstat)

The structure of the importer countries industry has changed a lot during the development of the Ukraine's cigarettes industry; if in 1994, before multinationals entrance to the Ukrainian market, import from the CIS countries amounted to 67.2% of the whole market in 1999 this number

equaled only to 15%. The main suppliers of tobacco in year 2000 were Brazil, Zimbabwe, Malawi, India and Kazakhstan (Agroperspectiva, 2000).

Tobacco prices are largely dependent on the producer country, brand and processing type. The price range of tobacco supplied in Ukraine was 1.5-5 USD per kilo CIF Ukraine, while Brazilian tobacco is at the upper limit of the price range, the prices for the Kirgizstan, Aizerbaidzhan and Kazakhstan tobacco fluctuate between 1.5-2.5 USD. (Agroperspectiva, 2000)

Ukraine also exports a portion of the tobacco produced. During 1994-1999 volumes of exports fluctuated from 504.5 to 1,579.8 tons, export highly increased in 2000 (to 4,030 tons) due to the supplies to Russia. (Agroperspectiva, 2000) Derzhkomstat actually gives a number of 5,080 tons for the exports of Ukrainian raw tobacco in year 2000. This difference occurs due to the ways of measuring of tobacco which can be considered as Ukrainian. Derzhkomstat estimates include all tobacco fermented at the Ukrainian plants, while part of this tobacco was previously imported in leaf form, then fermented and then exported back. Mainly this scheme works for the Russian Federation. Ukraine is exporting to the following countries - Russia, Moldova, Belarus, Poland and Hungary and the list of countries is stable during the last 6 years (Derzhkomstat).

The major producers of the Ukrainian fermented tobacco are plants of "Ukrtiutiun" Association and Russian-Swiss-Ukrainian Joint Stock Company "Tiutiun- Impex". The latter one captured about 2/3 of the market for now and is moving further ("Ukrtiutiun" Association).

Nevertheless, this market can't be described as a non-competitive one, due to the large volumes of the imported tobacco, which are many times larger than the Ukrainian ones, unless demanders are forced to buy domestic tobacco.

The demand side is represented mainly by the four Multinational Corporations: Reemtsma, Philip Morris, British American Tobacco and Japan Tobacco International. The cigarettes market share of those is about 94%, so we may talk about the case of oligopolistic behavior. Nevertheless, the market of low-price cigarettes, at the production of which Ukrainian tobacco is mainly used, can be considered to be a competitive one, due to the large presence of pure Ukrainian producers along with smuggled cigarettes (table2).

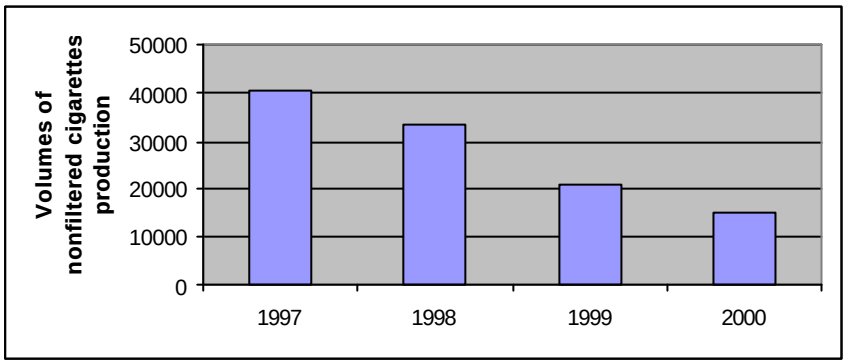



Table 2 (Derzhkomstat)

As far as we can see the following situation in the industry occurred:

1) for the last 3 years production of Ukrainian raw tobacco increased almost to the 10% of the total tobacco demand

2) although the number of cigarettes produced per year is relatively stable, the number of non-filtered cigarettes, for which mainly Ukrainian tobacco is used, substantially declined

3) exports of Ukrainian tobacco increased during this three-year period.

This leads to the situation when both demand and supply of Ukrainian tobacco stays at the very low level. Why has it happened? Producers of the Ukrainian cigarettes are dissatisfied with the quality of tobacco produced in Ukraine. The only multinational - "Reemtsma", the larger producer of non-filtered cigarettes, buys Ukrainian tobacco in quantity of about 1-1.2 thousand tones, which is almost equal to the total supply of it. Other companies refuse to buy Ukrainian tobacco due to the stated low quality of it. For example in 1999 BAT bought only 150 tones of Ukrainian tobacco, JT International about 70-80 tones (Galycki Kontrakty, 2000).

What do major Ukrainian cigarettes producers think about the obligatory use of Ukrainian tobacco? Opinions differ according to the present state of nature and brands of cigarettes produced. Survey conducted by Business (2001) gave the following results:

"Philip Morris Ukraine" argues that due to the content protection they would have to not produce some brands, because quality of Ukrainian tobacco doesn't suit the requirements for the ingredients used in their cigarettes.

"British American Tobacco Ukraine" states that it would agree to buy Ukrainian tobacco only in the case of improvement in the tobacco quality and if the price would be reasonable from the point of view of the cigarettes producer. The main concern of the company is possible monopolization of he market by the fermentation plants, which would allow them to charge too high price.

"Reemtsma Ukraine" feels itself calm, because it is the only one company, which buys a sufficient amount of Ukrainian tobacco. Company is more concerned not with the content requirement, but with the governmental interference in the market environment.

“JT International Company Ukraine” also complains of the low quality of the Ukrainian tobacco, which makes impossible its wider usage in the brands produced. The way out, says this company, is to buy low quality tobacco in the quantity required, but not to use it in cigarettes production.

*Chapter 3*

# LITERATURE REVIEW

The basic issue of my research is content protection, so I would like firstly to define this term. According to the Grossman (1981) content protection scheme requires that a given percentage of domestic value added or domestic components be embodied in a specific final product. Failure to meet the requirement most commonly entails the payment of high penalty tariff rate on the intermediate imports. Otherwise, the nominal tariff protection of the final good may be made contingent additionally to the content ratio, or other incentives or sanctions may be used to induce compliance.

The basic work on the content protection is "The Theory of Domestic Content Protection and Content Preference" by Gene M. Grossman (1981). Author considers what resource reallocation effects occur in the different situations under the content protection. The following situations are considered:

1) content protection of one intermediate: physical definition, which means that some physical fraction of intermediate good, say 10% of domestic raw material, should be used in the final product.

2) content protection of one intermediate: value-added definition, which means that there should be particular share of the value added of the domestic intermediate in the final product.

3) value-added content protection, many intermediate goods case: the same as 2), but several intermediates are used.

4) content protection and monopoly in the market for domestic intermediates

I'm particularly interested in the first type of conditions, because this is the kind of protection adopted in Ukraine. The main assumptions of the model are:

1) intermediates are used in the fixed proportions to output

2) competitive market structure is assumed

3) only a single imported intermediate is considered.

At the end author concludes that content protection have the same impact as tariff protection for the intermediate and acts as a subsidy for the final good producer. The author also states that, due to variability and difficulty to predict content protection may fail to achieve objectives of the policymaker, e.g. protection plan that was made for increase in output of the intermediate may fail if intermediate good producers are larger relative to the domestic market of their output, they are net exporters.

Michael Mussa (1984) said the other word in economics of content protection. Mussa's model allows the smooth substitution between intermediaries; small differences in quality of domestic and imported ones are existed. That differs from Grossman (1981) model, where assumption of perfect substitution was made. Mussa showed that usage of value added requirement and penalty tariff leads to the rise in unit production cost above its minimal level, so, production distortion is created. The other result is that ratio of domestic input to imported is increases. The intuition under the results obtained is the following: when content protection is introduced production of more intermediaries must employ domestic inputs, starting with the production activities where domestic inputs are the most efficient ones, but than moving to the activities where these inputs are less and less efficient comparing with the imported

ones. For example it is easy to produce low quality "Prima" cigarettes from Ukrainian tobacco, but for using this tobacco at least in "Prima liux" additional measures should be taken, such as finding more homogeneous shipment of tobacco, better dried one, which, in turn, leads to the increase in cost of production. Ratio of domestic input to the imported one increase due to the lower cost of fulfilling the content requirement in comparison with the penalty rate for the additional imported inputs. Also author states that:

"... content protection has the virtue of not inducing a distortion between the social cost of production (given the distortion of input choice) and the prices charged to consumer of the final product. For this reason, content protection is preferable to a tariff on imported inputs or a subsidy on domestic inputs as a policy to increase the ratio of domestic to imported input in the final output."

The other issue in question is what was the effect on the technical efficiency and improvement. The author proved that private and social benefit of technical improvements associated with domestic inputs are artificially reduced, while those associated with imported inputs are artificially increased, due to content protection requirement. This means that for reduction of imported inputs, in order to keep the protection ratio, excess investment in the technical improvements, which would reduce the amount of imported inputs would be observed, and underinvestment in the technology in which domestic inputs would occur.

Under the non-competitive behavior content protection doesn't lead to the usual difference between monopolistic or monopsonistic competitive behavior, unless it creates a monopoly or monopsony situation, which wouldn't exist in other cases. Of course, monopolist will generally sell the smaller quantity at the higher price than under competitive behavior, but introduction of the content protection will not change a situation, or affect

differences between monopoly and competition, because it directly affects only the cost conditions of final goods producers, not the demand conditions for their output.

The other paper which interested me a lot is " Trade and Efficiency Effects of Domestic Content Protection: The Australian Tobacco and Cigarette Industry" by John C. Beghin and C.A. Knox Lovell (1993). Australia is one of the countries where the same policy, which Ukraine tries to implement – content protection exists. In the paper authors show that domestic content requirement has neither trade nor domestic production effects as long as it not binding or just binding, in which case marketing contract stipulates domestic and imported leaf use at free trade levels, but influence only profit distribution between domestic growers and manufacturers by ability of domestic growers to raise their price. The following steps tested this hypothesis. Firstly authors tested for independence of domestic and imported leaf usage of the content requirement - this is how bindness of the requirement was tested. Hypothesis was tested econometrically and the results showed that the share of domestic to imported tobacco leaf increased, so trade has been distorted.

The second implication of the model was concerning the nature of marketing contract. Contract is Pareto efficient if growers and manufacturers cooperate to maximize joint surplus, in which case it is shown that domestic leaf use depends on domestic leaf production cost and the world price of competing imported leaf but is independent of the marketing contract price. Empirical evidence is consistent with this efficient market hypothesis: both world leaf prices and domestic costs influence shares of domestic and imported inputs, but negotiated domestic leaf prices do not. Unfortunately, such a study can't be conducted for Ukraine due to the several reasons. At first Ukraine just tries to implement content protection, so there are no empirical evidence of parties

behavior under content requirement. The other reason is the specific situation at the Australian tobacco and cigarettes industries work – here the case of bilateral monopoly is observed, while in Ukraine we can find competition from the supply side and slight oligopolistic competition at the cigarettes industry.

Bernard Munk (1969) tries to estimate welfare costs of content protection in the automotive industry in Latin America. Three major automotive markets in this region were considered - Mexico, Brazil and Argentina. Author states that since production in this countries is in general more expensive than in the developed countries successfully implemented higher content requirements lead to increase in the production costs. For the estimation of welfare costs foreign exchange savings and excess cost of production were chosen. As excess cost author defines the difference between the wholesale price to dealers of a vehicle produced in accordance with the country's content program, in the given year, and the CIF cost of supplying he same vehicle to the country through the exports from the United States. It was shown that regarding passenger vehicle manufacture, the content program of Mexico and Argentina led to significant amount of excess cost, while Brazilian excess cost were much lower, which confirms the assumption that the excess cost fell over time. Author concludes that implementation of the content requirement as a method to save foreign exchange leads to significant welfare loss.

Gordon C. Rausser in his " Predatory versus Productive Government: The Case of U.S. Agricultural Policies" (1992) considers if government regulation lower transaction cost, regulate externalities, correct market imperfections or is it a result of agriculture interest groups intervention. Author determines two kinds of government policy: the one which lead to increase in efficiency and correction of market failures – productive policy or PERT (politic-economic resource transactions), this policy leads to the increase in overall welfare. The

other one which simply transfer wealth through redistribution – PEST (political-economic-seeking transfers), under this policy no welfare gains are achieved, welfare is just reallocated between the groups. Group for support of which, e.g. tobacco manufacturers, this policy is created to gain more at the cost of the other group, e.g. cigarettes producers. The author states that through the main instruments of the income redistribution - price supports and public storage – PEST leads to the losses for consumers and tax payers, gains to farmers and deadweight losses. Losses and benefits of impact of such a policy were counted and the dependence on elasticity was found. The only crop, to which implementation of such a policy gave positive result was tobacco, but author argues that this effect occurred due to the large US export, which allow domestic producers to extract surplus from foreign consumers.

Measures of the degree of government intervention across commodity groups can be represented by a "producer subsidy equivalent" (PSE), the ratio of the total value of all public sector assistance to the total farmer receipts. The decomposition of the PERT and PEST policy can be done by the following: productive category includes all expenditures by the public sector that are expected to lower transaction costs and enhance the rate of economic growth, the PEST category, the redistributive transfers from other segments to agriculture are included, such as deficiency payments, price supports, trade barriers, input subsidies and so on. The main finding is that product with inelastic demand receive a lower proportion of the public support in form of productive policies, while gains in sectors with elastic demand are mostly productive ones. Author also argues that the ratio of PERT to PEST transfers increases with country income level and this suggests that one reason for the strong productivity growth in the developed country agriculture is that, despite a strong tendency toward increased protection, there is a complementary support towards research support.

*Chapter 4*

# THEORY

The techniques that can be used in evaluation of costs and benefits of regulation involves quantitative analysis of consumer's and producer's surplus (Westfield, 1971). This method can be used by fulfilling the following steps:

1) firstly, data on quantity and price for the industry output without regulation (free trade solution) should be obtained (in our case it is possible to do, because all data which may be found reflects exactly this situation, due to the recent implementation of the requirement)

2) than estimates of the slopes of the demand and marginal cost need to be made.

We obtain partial equilibrium solution for the free market situation

3) after that we may need to see how content requirement would change patterns of demand for the regulated inputs.

4) after finding an equilibrium point in the new, regulated situation, we than can compare consumer's and producer's surplus in both situations.

So, what is content protection itself and what changes in demand it cause? During the industrialization process many countries sensed an increase of imports of parts and subassemblies and a decline in the share of the domestic value-added in goods that are produced in multi-stage processes. Content protection evolved as a disguised means to protect the intermediate stages of production and, while averting some of the domestic and international opposition that additional tariffs may evoke.

Domestic content protection plans are most frequently used to protect automobile-producing interests, especially when assembly plants are operated by foreign multinationals. But the policy is potentially applicable whenever the intermediate goods are imported for further processing, and is being used variously to protect the producers of components for televisions and refrigerators in Taiwan, to encourage the use of domestic materials in Malaysia, and as part of the subsidy program in effect in the United States to revitalize the shipbuilding industry (Grossman, 1981).

The main assumption, which is made and is precisely applicable to the economics of tobacco content regulation, is that single intermediate input is imported and produced domestically, either by a competitive domestic industry, or by the final goods producers themselves for use in the production of a single final consumer good. The domestic industry is assumed to be small in the markets for both the imported intermediate good and the final good, so that the foreign prices of these goods are exogeneously given.

For the analysis of the content protection implementation on the changes in welfare of Ukraine the following is made:

The first step is to derive present supply and demand for cigarettes at the Ukrainian market. Although the problem of smuggling is quite essential for Ukraine we would stick to the official data, because estimates of smuggled cigarettes differ at the different sources. Elasticity of demand for cigarettes has not been estimated for Ukraine, and it is almost impossible to do due to the large amount of unreported activity in the industry, so we would stick to the number of 0.4 -0.6, which was estimated for the US and Canada (Becker, Grossman and Murphy, 1994; Sung H. -Y., Hu T. -W., and Keeler T., 1992)

Than we estimate the full derived demand for the raw tobaccos of different qualities, because content protection requires usage of 10% of the whole demanded tobacco. In estimations we use only unlicensed cigarettes production, due to the consequences of the law, which requires usage of Ukrainian tobacco only in the unlicensed brands of cigarettes.

Than the derived demand for the low quality tobacco need to be constructed. Survey of producers showed that Ukrainian tobacco goes mainly to the non-filtered cigarettes and amount used in the filtered ones is insignificant.

After constructing demand curve for the Ukrainian tobacco and total demand for tobacco we may derive percentage change in demand due to the new legislation and construct demand curves for the old and new demand of tobacco.

Than marginal revenue curves for the both kinds of demand need to be constructed, by using this curves we obtain the results for the profits before domestic content requirement and after monopolization of the industry.

*Chapter 5*

# EMPIRICAL PART

Firstly, I would like to present data description. For conducting the demand analysis the following data was obtained:

Data about raw tobacco production in Ukraine- it is monthly data given by the Derzhkomstat of Ukraine.

Unmanifactured tobacco price data - prices for tobacco are usually given for the harvest of the particular year and doesn't vary much during the year - it is yearly and quarterly data. There are two sources of such data - private sources (cigarettes producing companies), they provided the prices for different brands of tobacco both bought from Ukrainian producers and imported. The second source is Derzhkomstat - it is yearly and quarterly data of import (CIF factory) and export (FOB) prices and quantities divided by the countries of export/import.

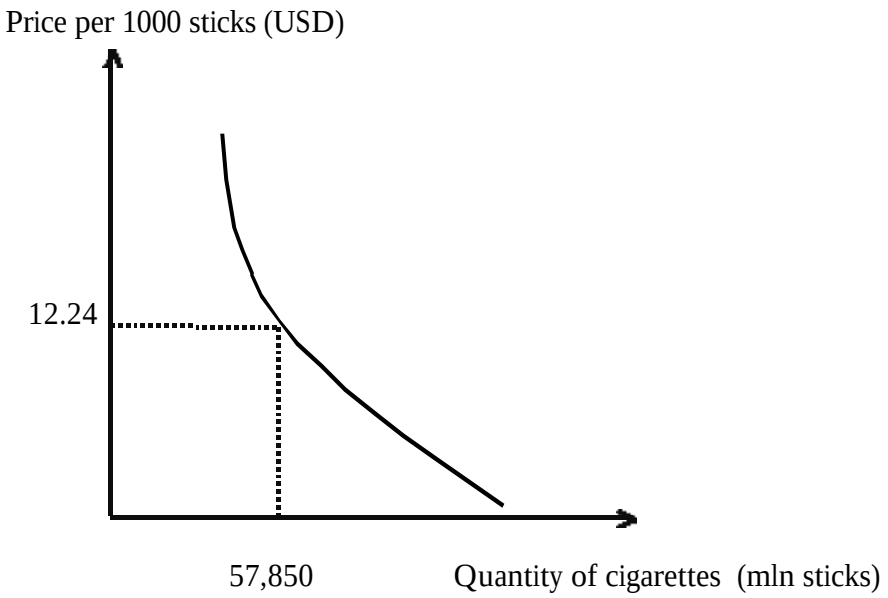
Price data on cigarettes - it is monthly data on average prices of Ukrainian filtered, Ukrainian non-filtered and foreign cigarettes.

Cigarettes production data - monthly data taken from Derzhkomstat, also data on yearly factories production of filtered and non-filtered cigarettes is obtained.

According to the theory part, the first step is to derive the demand curve for the cigarettes. Here I would like to take all cigarettes produced in Ukraine for the further defining of the total tobacco demand.

In year 2000 equilibrium quantity of the cigarettes produced was equal to 57,850 mln sticks. This quantity includes filtered, non-filtered and licensed brands of cigarettes. Equilibrium price was 1.332 UAH per pack. This price was obtained by using weighted average prices for the filtered and non-filtered cigarettes produced in the year 2000. While having average price per pack we may obtain price per thousand sticks, by multiplying price of pack by 50. So average price per 1000 sticks is 66.6 UAH. For the further analysis it is useful to transfer prices in Ukrainian hryvna into US dollar. There were no large gains in the exchange rate during the year, so we may use average UAH/USD rate, which equals to 5.44. So US dollar price per 1000 sticks of Ukrainian cigarettes is 12.24USD.

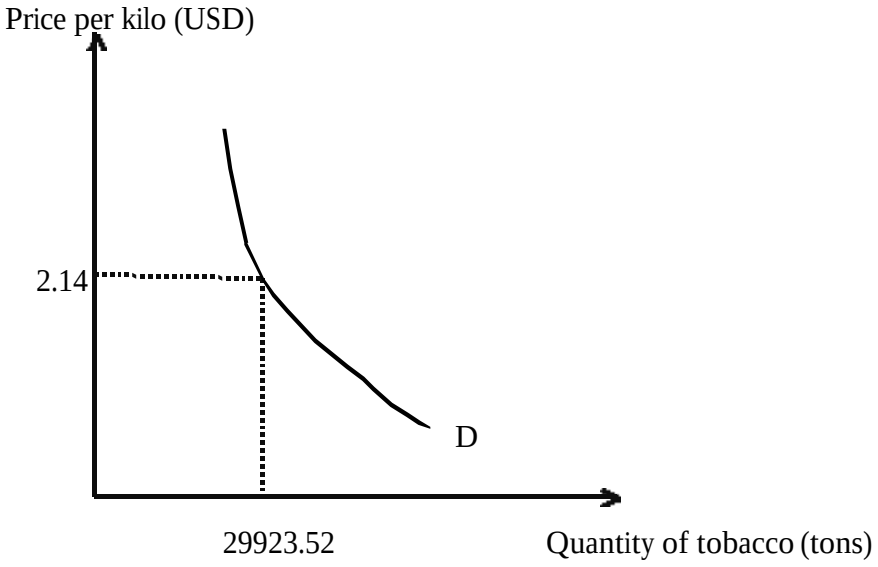
Figure 1. Demand for Ukrainian cigarettes




The second step is to construct derived demand for the tobacco of all brands. According to my survey of Ukrainian cigarettes producers (three multinationals out of four) percentage of production cost going for the tobacco is about 1/6 of total cost, considering other costs of production

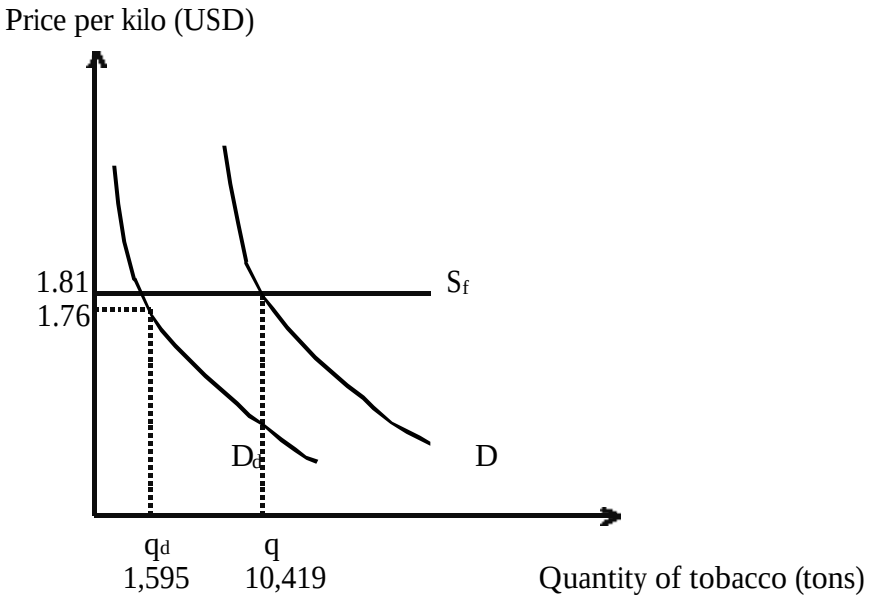
constant. We may construct demand curve for the tobacco having the elasticity, also equilibrium quantity is known - it was 46,820 tons of tobacco of different brands. From this quantity of tobacco demanded we might subtract quantity of tobacco, which goes to the licensed brands of cigarettes. This should be done due to the fact that law requires Ukrainian tobacco usage for the non -licensed brands of the cigarettes. In year 2000 21120.6 mln sticks of cigarettes were produced under the license, which amounted to the 16896.48 tons of tobacco. So the total quantity of tobacco demanded for the non-licensed cigarettes production can be found as total quantity of tobacco demanded minus tobacco, which is going for the licensed cigarettes and is equal to 29923.52 tons. Equilibrium price was estimated by using weighted average prices of the different brands of tobacco. The resulting average price is 2.14 USD per kilo of tobacco- in this case we already have price in US dollars, because both Derzhkomstat -for export/import prices and cigarettes producers prices for tobacco are reported in US dollars. The following demand curve for tobacco is obtained:

Figure 2. Total demand for the tobacco for the non-licensed cigarettes production.



Now we may derive the demand for the low-quality tobacco, which can be counted as a percentage of all tobaccos used. In year 2001 demand of Ukrainian tobacco producers was at the level of 10419 tons, which is a derivative of non-filtered cigarettes production, which is the main demander of low quality tobacco. Price for the low quality tobacco also was taken as the weighted average of the following categories: prices of the low quality tobaccos from the export/import data of Derzhkomstat. By asking the producers it was found that low-quality tobacco is mostly imported from the CIS countries, mainly from Kazakhstan, Kyrgyzstan, Russia and Moldova, as well as India and Malawi. All Ukrainian tobacco is assumed to be of low quality. The equilibrium price for the low quality tobacco was 1.80969 USD per kilo of tobacco.

Figure 3. Residual demand for the low-quality tobacco.




This derived demand curve shows producers demand for the total quantity of rough tobacco that can be decomposed as: $D = D_d + D_f$, where $D_d$ is demand for the domestic tobacco and $D_f$ is demand for foreign tobacco. We can see

that total demand for rough tobacco equals q. Demand for the Ukrainian tobacco is fraction of the foreign one and equals to the quantity $q_1$, which in year 2000 was equal to 1,595 tons. Supply of the imported tobacco is assumed to be competitive, so marginal costs are horizontal.

At this stage the following conclusions can be made:

Total demand for the tobacco of unlicensed cigarettes brands from the cigarettes producers side is 29923, 52 tones. 10% content requirement implies that 2,992 tones of the Ukrainian tobacco must be used in cigarettes production, so new legislation leads to the 200% change in demand.

As most of the producers predict and as trends over the last three years are shown, "Tiutiun Impex", which owns 4 out of 6 working plants is moving to the monopoly, so after enforcement of the law in question we may expect monopolist behavior from this side. In this case we construct marginal revenue curves for the both demands (old and new one) for the Ukrainian tobacco.

For estimating the impact of the law on the social welfare we estimate gains and losses from its adoption.

The following set of assumptions need to be made:

1. Although reported elasticity of demand for the developed countries equals 0.4 - 0.5, in Ukraine, as in the most transition economies this indicator could be much higher. The reasons for this are at first, low level of income in Ukraine, which makes a consumer more sensitive to the changes in price. The second reason is the age of the larger share of smokers - it is young people, income of who is usually relatively small and unstable. The other reason for

higher elasticity of demand is problem of smuggling- about 30% of non-filtered cigarettes are smuggled, mainly the ones from Russian Federation and Moldova. So, we may assume that elasticity of the demand for cigarettes in Ukraine can be equal to 0.8- 0.9. This assumption is also supported by findings of Chaloupka J., Frank, Hu, T.-W., Warner E., Kenneth, van der Merwe, Rowena and Yurekli, Ayda (2000) who estimated elasticity of the tobacco demand in the low-income countries. Estimated elasticity is found to be at the range of 0.6 – 1.0.

2. The next assumption concerns elasticity of supply of raw tobacco. At the present time this market is highly competitive and its elasticity converges to infinity. Anyhow right after the law implementation short run elasticity would be not very high, while in the long run it would move to the previous number. The reasons for such a movement are:

In year 2000 JSC "Tiutiun- Impex" controlled 2/3 of the Ukrainian fermented tobacco market and tended to capture even larger share of it - this gives us not very elastic short-run supply curve.

The long run elasticity, however, will be quite high due to the following reasons: cigarettes companies, if found to pay higher prices, will stimulate competition, they may organize their own production of fermented tobacco, fermentation plants, which decreased their production a lot due to the unfavorable environment may decide to increase volumes of production.

3. This assumption concerns marginal costs of tobacco production. Due to the lack of data they can be quite approximate, but to increase the precision two methods were used.

First method was based on calculating the cheapest price for the product sold in the competitive environment and equalizing it to real costs. Such estimates can be done by using price data on exports to the Russian Federation. Russia was the major exporter of Ukrainian tobacco in year 2000 and market for raw tobacco there is highly competitive. According to this data we get an estimate of about 1.54 USD per kilo of raw tobacco.

The other method is based on the direct calculation of costs of producing fermented tobacco:

| | | | | | | |
|---|---|---|---|---|---|---|
| *marginal cost of production* | = | *price of raw tobacco* | + | *labor cost* | + | *cost of energy usage* |

where price of raw tobacco for 1999 harvest is obtained from “Ukrtiutiun”, average salary and number of workers at the fermentalization industry data is taken from Derzhkomstat.

Estimates give the number about 1.4 USD, which is comparable with 1.54 USD price per kilo.

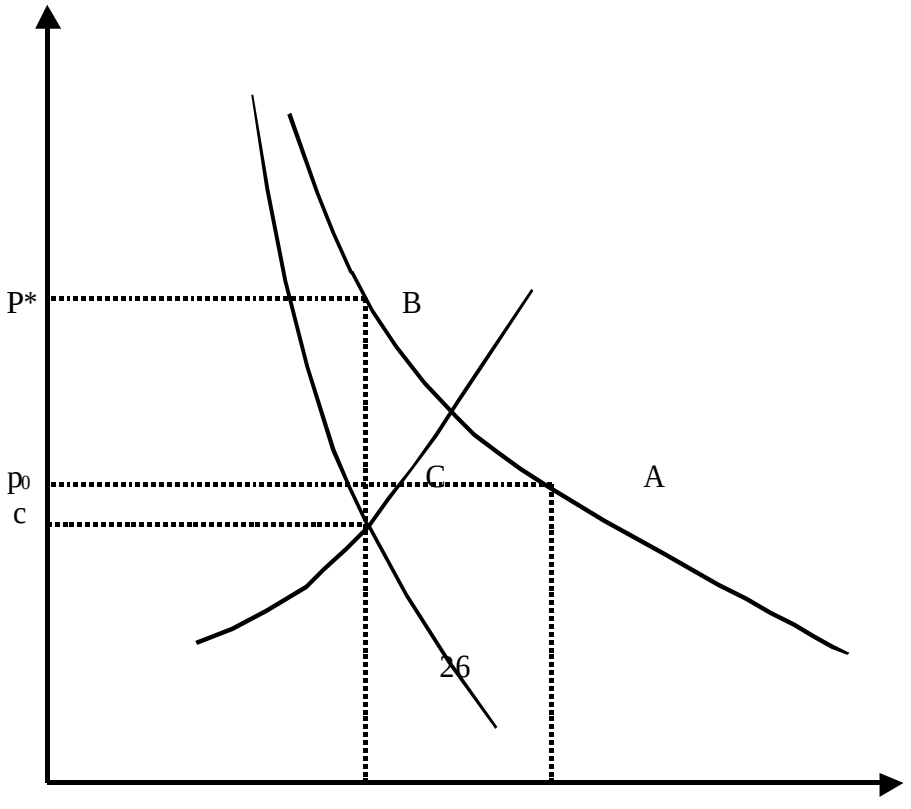
Nevertheless, in my opinion, Russia export prices give more reliable estimation of the marginal costs, so during the analysis I would prefer to stick to this number.

Thus, we may assume that cost of tobacco production stay at the level of about 1.54 USD per kilo.

Assumptions lead us to the following analysis of the situation, which would occur after law implementation.

Two situations under consideration are: the competitive market with the required by law quantity of tobacco bought by cigarettes producers and another situation, which is more likely to occur when monopoly pricing is involved.

Figure 4. Tobacco market after law implementation.



Demand

MR

q* $q_0$ Quantity of tobacco (tons)

Indication of the new monopolistic price estimation is the following:

$q_0$ - equilibrium quantity of tobacco which would be demanded after the implementation of the law;

q* -equilibrium quantity of tobacco demanded under the monopoly;

$p_0$ - equilibrium price of tobacco demanded in year 2000;

p* - equilibrium price of tobacco demanded under the monopoly;

c – costs of production of raw tobacco;

MR – marginal revenue of the monopolist.

The elasticity equations are:

$$e = \frac{\partial q}{\partial p} * \frac{p}{q} \qquad \Rightarrow \qquad \frac{\partial q}{\partial p} = \frac{q_0}{p_0} * e$$

Now we need to derive demand equation:

$q_0 = a + \mathrm{bp}_0$, where $b = e * \frac{q_0}{p_0}$ $\Rightarrow$ $q_0 = a + e * \frac{q_0}{p_0} p_0$, than

$a = q_0 - e\, q_0 = q_0\,(1-e)$

(here we use the general form of equation, but the negative sign of elasticity would be considered further)

After obtaining intercept point and having equilibrium price, quantity and elasticity of demand we derive demand equation:

$$q = q_0(1-\boldsymbol{e}) + \boldsymbol{e}\frac{p_0}{q_0}p,$$

Price function of the demand equation would look the following way:

$$p = \frac{(\boldsymbol{e}-1)}{\boldsymbol{e}}p_0 + \frac{1}{\boldsymbol{e}}\frac{p_0}{q_0} * q;$$

These functions lead us to the obtaining marginal revenue curve, which would look the following way:

$$MR = \frac{(e-1)}{e}p_0 + \frac{2}{e}\frac{p_0}{q_0} * q*;$$

We have number for number for marginal revenue from the equation *MR=MC,* so we obtain equations for the monopolistic quantity and price:

$$q* = (MR - \frac{(e-1)}{e}p_0) * \frac{q_0 e}{2p_0};$$

$$p* = \frac{(e-1)}{2e}p_0 + MR/2$$

In our case :

$$q* = (1.54 - \frac{(-0.8-1)}{(-0.8)}1.76) * \frac{(-0.8) * 2292}{2 * 1.76} = 1659.2$$

$$p* = \frac{(-0.8-1)}{2*(-0.8)}1.76 + 1.54/2 = 2.75$$

Obtained numbers lead us to the following results:

Price of the Ukrainian low-quality tobacco would rise to the range of the finest brands of tobacco prices, which are now about 2.9 USD per kilo.

The other point is that anyway content requirements would not be complied, supply of the Ukrainian tobacco would be almost twice less than the law requires, so cigarettes producers would need to import the difference and, possibly, pay penalty fee for not fulfilling the law enactment.

Thus, we may predict that over few next years the situation would be the following:

Very high price of domestic tobacco along with the shortage in its quantity would lead to the increasing supply of raw tobacco, which may be initiated by the cigarettes producers or some new local producers may appear.

This situation would hold until the whole demand for the domestic tobacco could be satisfied and price for the tobacco would fall due to increasing competitiveness, which would lead to the rise in elasticity of supply.

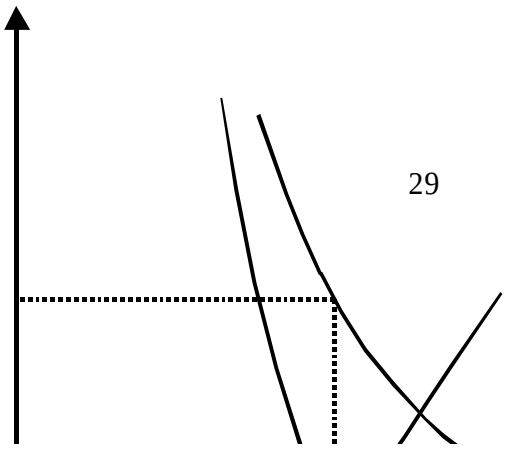
The other point, which is needed to be considered, is growth of share of the licensed cigarettes in the overall supply of cigarettes. So, we would observe fall of the demand for the Ukrainian tobacco.

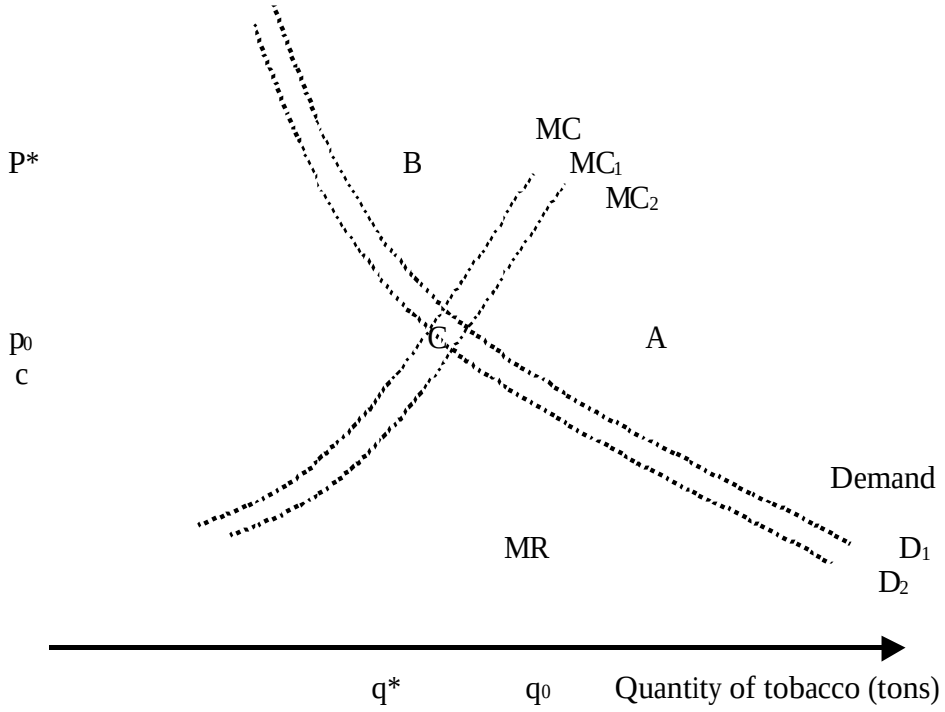
At the end, even with required content protection, Ukrainian tobacco market would find itself in the competitive equilibrium after all adjustments have been made.

Graphically situation can be described as follows:

Figure 5. Tobacco market after law implementation: adjustment process

Price, cost (USD)




MC
P*
B
MC1
MC2
p0
c
C
A
Demand
MR
D1
D2
q*
q0
Quantity of tobacco (tons)

*Chapter 6*

# CONCLUSIONS AND POLICY IMPLICATIONS

According to the analysis made, the following conclusions can be derived:

Ukrainian market of the raw tobacco would be distorted for the next several years due to the adoption of the law "On Stimulating the Development of Agriculture for the 2001 – 2004 Period".

Increase in the production of Ukrainian tobacco would occur only after new raw tobacco producers entrance into the market, because total supply of all quality tobacco in Ukraine is already covers the amount which producers would need to buy due to the law content requirements.

Long period of law implementation would lead to the two opposite effects: on the one hand, producers of cigarettes may license more of the brands they produce and rename popular brands of cigarettes, such as "Prima" and "Vatra". Additional costs would than go not to the Ukrainian tobacco producers, but to the advertising campaign of renamed brands.

On the other hand, cigarettes producers may find it attractive to promote production of raw tobacco in Ukraine by producing it themselves.

The other possible strategies for the cigarettes producers are:

If penalty fee for not-fulfilling the content requirement would be high enough, tobacco companies may decide to buy Ukrainian tobacco in the obligatory quantity and not to use it, as one of the officials of Japan Tobacco

International said (Biznes, 2001). The more realistic version of this situation is companies' decision to resell the tobacco at a lower price either at the foreign and the domestic markets and to lose the margin between buying and selling price.

Cigarettes producers may also try to lobby the canceling of the law, if they would find out that cost of changing the legislation are lower than from ones from usage of domestic tobacco.

The other variant is to lower quality of non-licensed cigarettes, which can move down, for example to that of smuggled Russian ones and to buy Ukrainian tobacco at the quantity required. This possibility is highly rejected by the cigarettes producers, that claim that they would not decrease their quality requirements, for not loosing the consumers.

The most promising looks the situation under which cigarettes producers would participate in raw tobacco production which would enable them to control the quality and costs from the very beginning of the process and obtain tobacco of acceptable quality and for the reasonable price.

Further research of the law implementation may raise the following issues:

After setting the penalty fee for the content requirement non-fulfillment by the Cabinet of Ministers the most likely strategy of the cigarettes producers can be obtained, e.g. if penalty is to high, import of raw tobacco under the content requirement quota would be too expensive and producers would prefer to use domestic tobacco.

Another issue in question is how long the transition period from the monopolized market of raw tobacco to the competitive one would take. This is largely depends on the penalty fee and real price, set by the monopolist.

One more question for analysis is estimation the cigarettes producers' costs of canceling the parts of the law concerning tobacco. If they would be lower than losses of its implementation, cigarettes producers may lobby canceling of the law.

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