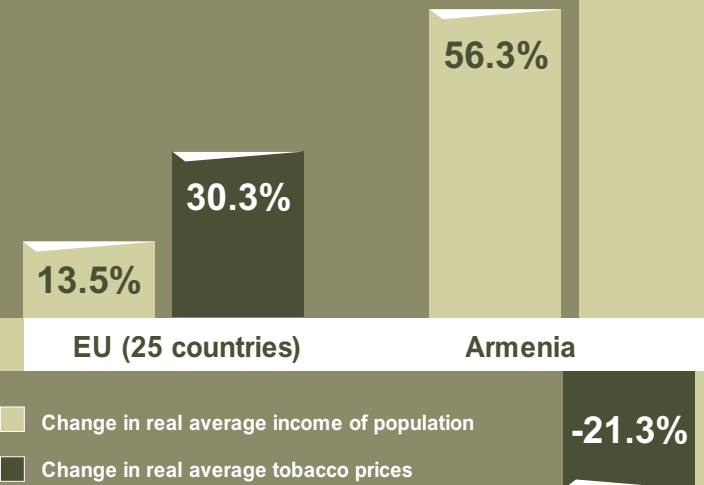




International Center for
Human Development

This publication was supported by a grant of the Open Society Institute Assistance Foundation. It advocates for the need to raise tobacco taxes in Armenia and suggests relevant scenarios. The project has been conducted by the International Center for Human Development.

Why and How Much to Increase Taxes on Tobacco in Armenia



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Yerevan 2006

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Summary

Experience of any country (regardless of its income level) testifies that the raise in tobacco prices via increase of excise tax is the most effective way of making the smokers give up this deadly habit, as well as preventing the process of replenishing the smokers' army with beginners. In countries deemed to be pioneers in the fight against smoking the gradual increase of tobacco prices through increased taxes has long become one of the most important directions of government long-term policy.

Within 2000-2004 in 25 European Union countries the real prices for tobacco have increased in average by approximately 30 percent, while the growth of the real income of population has amounted to 13.5 percent. This implies that the rate of growth of tobacco prices have exceeded the rate of income growth, which fully fits into the logic of an effective public health policy.

In Armenia we have the opposite picture. Within the period of 2000-2004 alone the average real prices for tobacco have dropped by over 21 percent, while the real income of population has grown by more than 56 percent over the same period of time. As a tendency, this is directly the opposite of the one in Europe. In the European Union from year to year cigarettes become less and less affordable for the population, especially for its vulnerable groups, whereas it is quite the opposite in Armenia – the deadly product is becoming more and more affordable for everybody, including the poor, youth and children.

Estimations made based on the theory and other countries' experience evidence that increasing the tax charged from 1000 cigarettes in Armenia from the current 5000 drams to at least 10000 drams is the minimum necessary measure that will allow us to take a step towards a more effective public health policy along with increasing the state budget revenues.

Preface

According to the official statistics, the number of people with cancer is continuously growing in Armenia in the recent years. Heart and cardiovascular diseases have also demonstrated an upward trend. Mortality from cancer and cardiovascular diseases has made 72 percent of the overall mortality in 2003. Smoking is known to be the biggest risk factor causing the mentioned diseases.

Based on the data of the year 2000: (1) 33 percent of all mortality cases recorded in Armenia were a consequence of smoking. Moreover, 71.3 percent of mortality from respiratory diseases were a result of smoking, for mortality caused by heart diseases - about 30 percent, and for mortality from lung cancer - approximately 92.3 percent. In general, at least 48 percent of the mortality from all types of cancer in Armenia was associated with smoking (the data refer to male population in the age of 35-69).

The need for introducing changes in implemented policy priorities in favor of tobacco regulation is conditioned by the following arguments:

1. Three thousand people die annually in Armenia in the result of smoking cigarettes, which, for example, is three times more than deaths from accidents, poisoning etc;
2. Estimations show that if people had spent the money otherwise used for purchasing cigarettes on consumer goods, 200 thousand people in Armenia would no more be considered poor¹;
3. Despite the growing tobacco industry, Armenia remains a tobacco importing country. Annual volume of exports covers only 10 percent of the volume of imports. The negative impact of tobacco trade on the foreign exchange market makes around 30 mln dollars annually. It is worthwhile noting, that this figure is comparable to the volume of loans received from the International Monetary Fund aimed at stabilizing the same foreign exchange market;
4. Armenia cannot but take participation in the initiatives of the progressive world that aim to make human life healthier and safer.

¹ In accordance with the methodology based on ensuring the minimum of 2100 kcal per capita

This list of arguments can be continued.

It is a well-known fact that mortality from smoking can be prevented with the help of increasing taxes on tobacco, bans on advertizing, raising public awareness etc. All of these measures need to be implemented effectively in Armenia.

Impact of increase in tobacco taxes

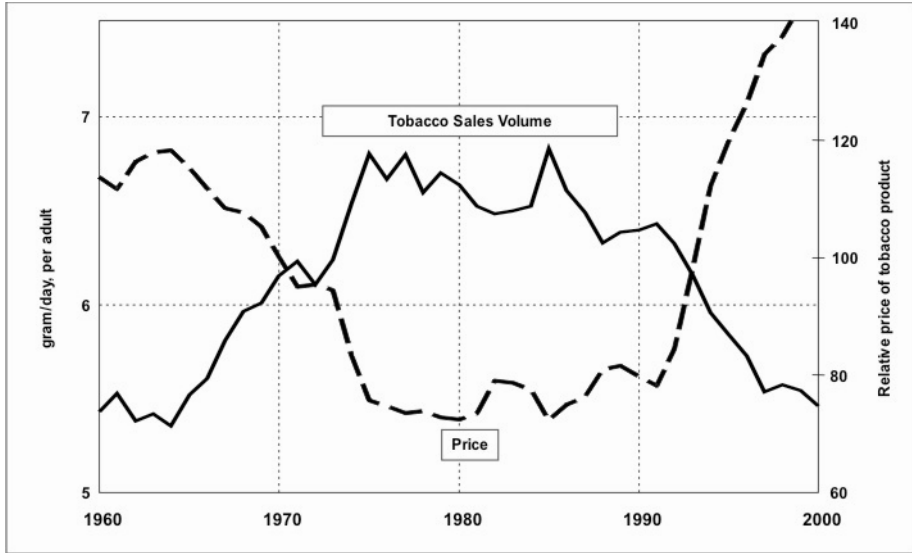
Experience of any country (regardless of income level) shows that increase in tobacco prices through the increase of excise tax is the most effective tool in forcing the smokers give up this killing habit as well in preventing formation of new-smokers army. According to the World Bank data, in high-income countries a 10 percent increase in tobacco prices has led to an approximately 4 percent reduction in cigarette consumption, whereas in middle- and low-income countries it's up to 8 percent. Despite the fact that tax increase causes significant reduction in consumption, it nonetheless brings about essential growth in the state budget tax revenues. The largest potential to collect additional taxes from tobacco is attributable to countries like Armenia, where the percentage share of taxes in price for tobacco is relatively small leaving notable space for price increases and collection of additional tax revenues. Opponents of increasing tax most often argue that decreased consumption resulted from the price increase will lead to reduction of the number of jobs in the tobacco industry. But the current practices prove that resources employed in tobacco industry are most of the times re-directed to production of other goods and services, thereby generating new jobs where others are lost.

Impact of tax increase on the demand for tobacco products

Researches demonstrate that tax increase on tobacco results in price increase. Several researcher groups have surveyed smokers' reaction to tobacco price fluctuations within different time-frames and in various locations of the world. Majority of researches recorded negative correlation between changes in price and in consumption. It is well known that the elasticity of demand is the proportionate change in demand for the product as a result of a unit change in price.

Demand grows as the price decreases. That is explicitly demonstrated in Figure 1.

Figure 1. Relative inflation-adjusted prices of cigarettes and daily per capita consumption of tobacco, France, 1960-2000:

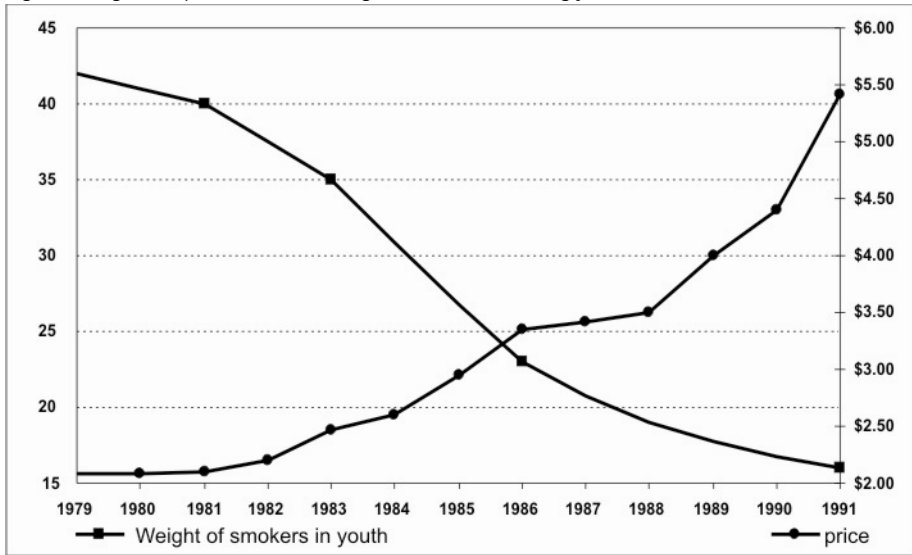


Source (2)

Furthermore, a several decade-long research on the volume of tobacco consumption in France evidenced -0.3 price elasticity (2). By and large, many researches carried out in high-income countries have identified decline in demand of around 4 percent against 10 percent increase in the prices which is consistent with price elasticity of -0.4 percent (3, 4, 5).

Young smokers are most “vulnerable” to the tobacco price increase; their social status and relatively shorter smoking experience allow them to quit that dangerous habit much earlier. Thus, real prices for tobacco in Canada for the period of 1979-1991 went up from 2.09 to 5.42 USD resulting in a reduction of the unit weight of smokers among 15-19 years old young people from 42 to 16 percent (see Figure 2).

Figure 2. Cigarette prices and unit weight of smokers among juveniles, Canada, 1978-1992:



Source (10)

In low- and middle-income countries a higher price elasticity of demand was observed ranging in the interval of -0.6 to -1. It is internationally accepted practice to apply average elasticity of -0.8 for such countries (3, 6).

Researches have also shown that part of the consumers responded to the price increase by shifting to the use of lower-price cigarettes (7, 8). Therefore, to achieve reduction in overall volumes of tobacco consumption, taxes on all types of cigarettes should be raised simultaneously to maintain a level of difference between prices for different tobacco products that would minimize the possibility of substituting one type of cigarettes with another.

Impact of taxes on the tobacco prices

Projection of tobacco prices increase resulting from tax increase plays an important role in defining adequate tax rates to be applied to tobacco. It implies such a tax policy that is aimed at not only ensuring the budget revenues, but also curbing the smoking epidemic by increasing the number of quitting smokers by means of price leverages.

Price leverages, as mentioned above, are the most effective tool in scaling down tobacco prevalence, and the extent of effectiveness thereof depends on the situation in specific tobacco markets.

In low- and middle-income countries tobacco taxes are generally lower than in high-income countries. Prices in comparatively "richer" countries are respectively higher. Generally, they constitute over 2/3 of the cigarette price.

In highly competitive markets any increase in tax rates is expected to be immediately and fully reflected in the commodity price, thus putting the tax burden on the end consumers' shoulders. Otherwise, when dealing with monopoly markets on one hand, and with the phenomenon of surplus profits in the sphere on the other hand (given the fact that usually the cost price of cigarettes is many times less than the sale price) there is a chance that the cigarette producers themselves will bear the additional tax burden unwilling to raise the price of the product. It should be noted that instead, in reality we more often witness oligopoly markets where specific mechanisms of reflecting taxes on eventual prices are in place. According to a number of empiric data from countries where oligopolies cooperate less with each other, tax increase has only partial impact on the price as the producers compete by means of lower prices. Yet, more often we see markets with a more coordinated cooperation at work. In such markets the tax increase fully, at times to a greater extent, affects the price which is explained by the practice applied by oligopolies, when the producer first defines a lower price than expected in attempt to involve as many consumers as possible causing addiction to smoking, and then in case of tax increase, raises the sale price disproportionately high, thus expanding his profits.

Nevertheless, it cannot be denied, that in either way tax increases impact retail price of cigarettes to this or that extent resulting in reduction of number of smokers. Reduction sizes vary across countries. There had been a number of studies in specific countries to evaluate the sizes of reduction.

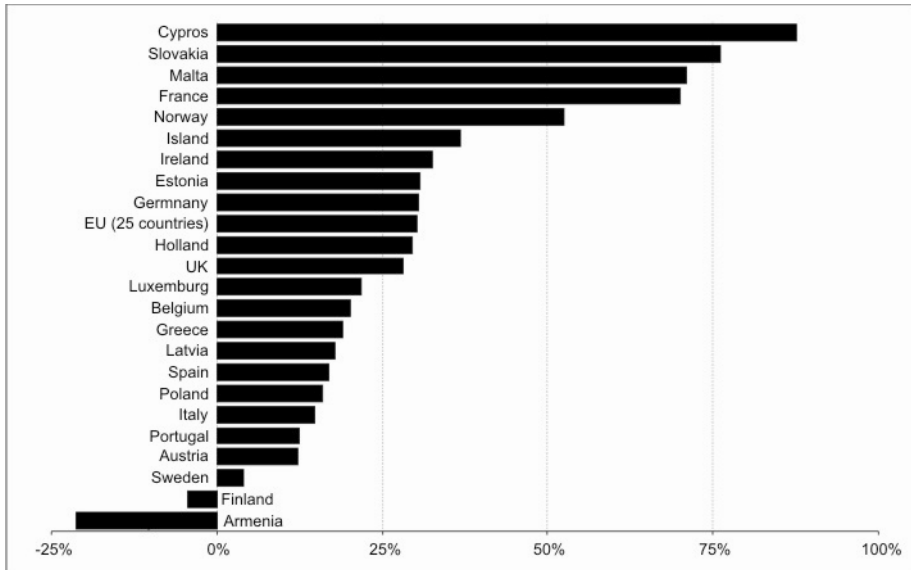
Armenia – European Union: Comparative Analysis

In countries considered to vanguard in the fight against smoking gradual increase of tobacco prices by increasing taxes has long become a vital trend of long-term government policy in that sphere. All countries declaring human health as a priority, including USA and Canada have achieved obvious success in that sphere. As Armenia has recognized integration into Europe to be among its foreign policy cornerstones and we are already witnessing active works associated with adoption and localization of European rules of the game in many spheres, we'll attempt to understand where the European Union is heading to in terms of tobacco taxation policy and where Armenia is heading to.

Compared to Armenia prices of cigarettes in European countries have always been higher (at least in the last decade.) European countries with relatively lower inflation level from year to year have demonstrated a trend of **outrunning** growth of prices on tobacco, in the result of which real prices of cigarettes also have **uninterruptedly** grown. As an example, during five years of the period of 2000-2004, the average growth in average real prices for cigarettes in Europe (the average among 25 EU countries before its expansion) has constituted about 30 percent (see Figure 3). This means that, all other conditions being equal, cigarettes have become 30 percent less "available" for European consumers that may serve as a clear indicator for **evaluation** of the adopted course of action and pursued government policy.

As far as Armenia is concerned the picture is different. Tobacco prices here have been low and are low for the time being. Furthermore, in recent years they have continuously decreased in real terms. Just within the period of 2000-2004 average real prices of cigarettes in Armenia have dropped by over 21 percent. As a trend it is in direct contradiction with the European trend, which can be obviously seen also in Figure 3.

Figure 3. Changes (in percentages) in average real prices for cigarettes during five years, European Union countries and Armenia, 2000-2004



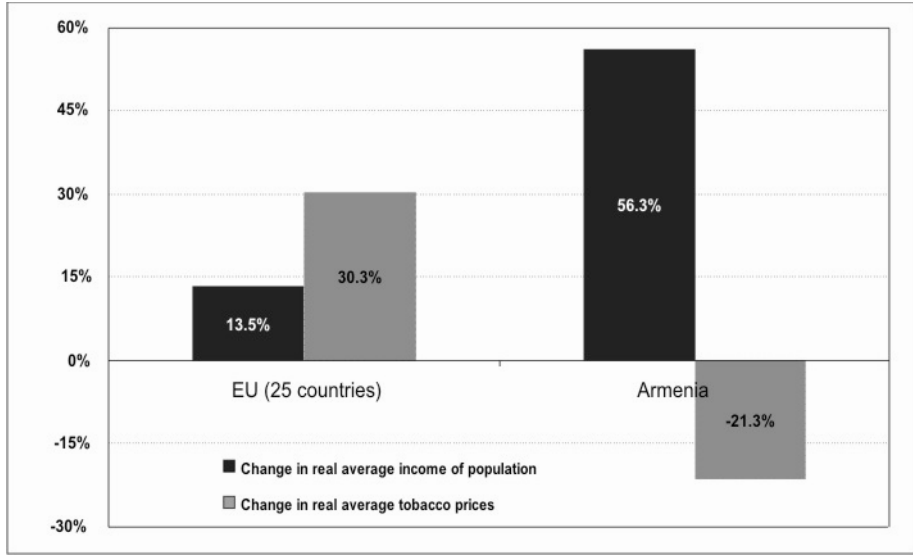
Source: For EU countries Euro-stat epp.eurostat.ec.eu.int, for Armenia RA NSS "Armenia Statistical Yearbook" 2004, 2005

The issue of more or less “availability” of cigarettes is conditioned not only by the price factor. Here comes to play a role the dynamics of the real income of population. Therefore, when considering the issue of affordability of cigarettes the collation of real prices for cigarettes and real income of population needs to be studied. And here too the state of things is not on the side of Armenia. Within the observed period (2000-2004) 30 percent increase in real prices for cigarettes in 25 European Union countries was accompanied by a 13.5 percent increase of the populations’ real income (see Figure 4). This implies that the increase in cigarette prices has outrun the income growth, which fully fits into the logic of an effective public health policy.

We face the opposite picture in Armenia. Within the last decade the Armenian economy has recorded a trend of high economic growth, moreover, the annual GDP growth for recent years is even estimated with double-digit figures. As a consequence the population income grows. For the period of 2000-2004 alone the real income of population grew by over 56 percent. This is indeed encouraging from the perspective of living standards improvement, yet it has to be mentioned with bitterness that effective economic growth policy in Armenia was not accompanied by a tax policy that

would ensure concordant growth in cigarette prices and would be closely related to public health. The result is illustrated in Figure 4. From year to year cigarettes are becoming less and less affordable for the population especially for the most vulnerable groups in the European Union, whereas in Armenia it is just the opposite – the killing product is becoming more and more affordable for everyone.

Figure 4. Changes (in percentages) in average real prices for cigarettes and in real income of population during five years, average of European Union countries and Armenia, 2000-2004



Source: For EU countries Euro-stat epp.eurostat.ec.eu.int, for Armenia RA NSS "Armenia Statistical Yearbook" 2004, 2005

Possible scenarios of increase of tobacco taxes in Armenia

Revenues generated from tobacco taxation constitute an essential part of the State Budget, this fact being often speculated on by the tobacco producers as an argument confirming the vital role of tobacco production for the overall economy. At the same time, there is a wrong belief that due to tobacco tax increase the demand for cigarettes will decrease thereby reducing the total budget revenues. However, the international experience claims the opposite. It's true that increase in tobacco taxes brings about a decrease in the number of smokers, but that is fully compensated by increased tax. In all countries applying a similar policy the budget revenues have not reduced but instead increased.

Let us try to derive the scenario or scenarios of increasing taxes on tobacco in cases of which the state budget at least does not suffer revenue-wise. To do that we first and foremost need to derive the tobacco demand curve for Armenia, whereas, unfortunately, it is not feasible to carry out estimation of tobacco price elasticity indicator because previously there have not been, for example, regular researches on assessing smoking prevalence. Unless we possess time series of the aforementioned indicator we cannot arrive at a conclusion on the potential impact of the price increase on the volume of cigarette consumption.

One potential solution to this situation can be application of internationally accepted comparable models. Economist Chaloupka suggests applying price elasticity of -0.08 for countries with level of income comparable to Armenia's level. Meanwhile, an indicator of -4 percent is proposed for countries with level of education comparable to the one in Armenia, but with higher income. This means that we will not err much in our further estimations if we persist in this range from price elasticity perspective.

Thus, there is no estimation of cigarette demand elasticity for Armenia, but it exists for a number of other countries. In order to assess the possible response of market to price increase we can collate the indicators of Armenia and other countries under consideration using purchasing power parities.

Now, based on the cigarette demand indicators of 4 countries (China, Indonesia, Turkey, Estonia), let us draw the cigarette demand curve for Armenia. On one hand,

these countries are in a “safe²” interval of price elasticity (from -0.05 to -0.03), and on the other hand they demonstrate pronouncedly different behaviors within that interval. In this connection, when building the curve we may take into account fiscal assumptions that are “safer” from taxation viewpoint.

Assumption 1.

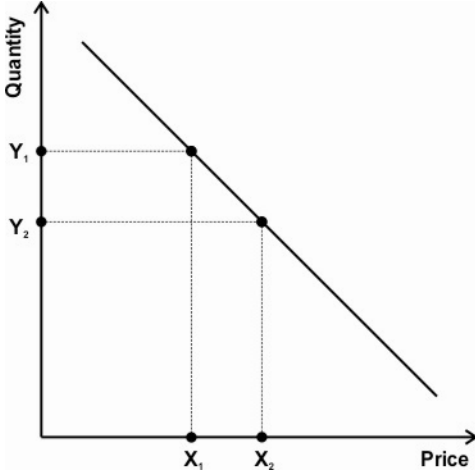
- All other conditions being equal, we can assert that the main differences in the behavior of cigarette consumers are in the income level and cigarette price.
- Increase or decrease in the level of income results in a parallel shift of the demand curve³.
- In terms of price/volume combination various countries are at different points of market equilibrium.
- For price comparison it is not appropriate to apply the market exchange rates. The picture will be more realistic when the purchasing power parities are applied.
- Given the foregoing we could use the following indicators of the countries in comparison:
 - Compared parity price,
 - In case of the mentioned price, the change in demand at a 10 percent step (S).

² By “safe” we mean the interval which does not assume or will not lead to drastic changes in demand as a result of smallest insignificant change in prices.

³ As it is not possible to derive an accurate demand curve for Armenia, it’s hard to say to which of the 4 countries the curve slope is the closest. As we are only interested in the given elasticity interval, this provision allows us to come up with minimum and maximum margins of demand change estimation.

In order to derive the comparable demand curves for Armenia based on the indicators of the 4 countries, let us take the general view of the demand curve:

Figure 5. The general view of the demand curve



In Figure 5, point X_1 is the cigarette price prior to increase which corresponds to Y_1 consumption volume. As a result of 10 percent growth in cigarette price due to tax increases ($X_2 = X_1 \cdot 10\%$) the demand for cigarettes decreases to Y_2 , where $Y_2 = Y_1 \cdot E$, and E is the elasticity.

Here we have the following equations:

$$A \cdot X_1 + B = Y$$

$$A \cdot \frac{X_2}{(1+S)} + B = \frac{Y_2}{1+E}$$

$$A \cdot X_2 + B = Y_2$$

Deciding the above-mentioned equations for coefficients A , B and for Y_2 we will have the following system:

$$(A, B, Y_2) \rightarrow \left[\begin{array}{l} E \cdot Y_1 \cdot \frac{(1+S)}{(-X_2 \cdot E + E \cdot X_1 + S \cdot E \cdot X_1 + S \cdot X_2)} \\ Y_1 \cdot X_2 \cdot \frac{(-E+S)}{(-X_2 \cdot E + E \cdot X_1 + S \cdot E \cdot X_1 + S \cdot X_2)} \\ X_2 \cdot Y_1 \cdot S \cdot \frac{(1+E)}{(-X_2 \cdot E + E \cdot X_1 + S \cdot E \cdot X_1 + S \cdot X_2)} \end{array} \right]$$

To minimize the percentage of possible error similar equations were decided using data from several other countries:

Chart 1. Main indicators for deriving cigarette demand curves for several countries and ensuring comparability

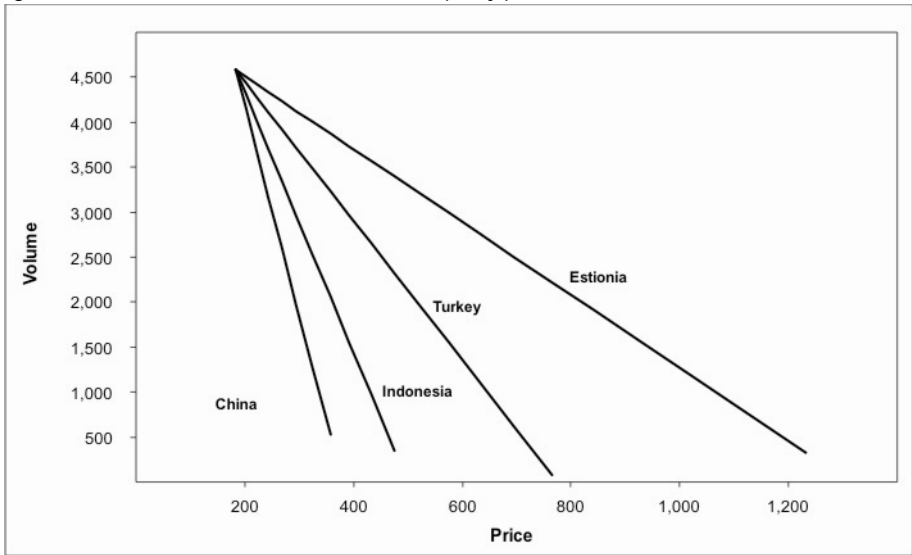
Country	Indonesia	Turkey	China	Estonia
Purchasing power parity (local currency/international dollar)	2,643.72	618,292.93	1.99	6.42
Price	3,406.25	1,108,385.0	2.06	17.00
Elasticity - E	(0.05)	(0.04)	(0.05)	(0.03)
Purchasing power parity-adjusted price - X2	180.60	251.28	145.10	371.34

Chart 2. Cigarette demand in Armenia with indicators ensuring comparability with other countries

	Armenia
Purchasing power parity (local currency/international dollar)	140.2
Price (dram) - X ₁	183.2
The amount of tax	22681
Volume - Y ₁	4579.5
Step-S	0.1

For the selected countries the demand curves in parity prices (dram) look as follows:

Figure 6. Demand curves of certain countries in parity prices



In fact, it turned out that the demand curve for Armenia may be positioned within the interval of curves reflected in Figure 6.

Now, taking the demand curve as a basis, we will try to estimate changes in price and demand and gauge the possible scenarios of tax rate changes.

Assumption 2. In case of tax increase the whole tax burden will fall on consumers (the mentioned assumption is based on the international experience, as was already mentioned above).

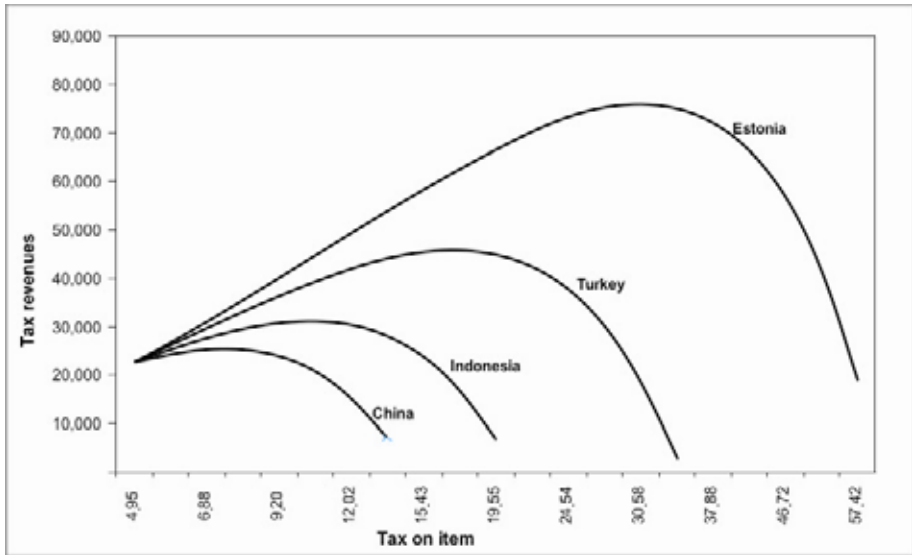
In order to estimate the amount of tax revenues ensured at each tax rate it is necessary to place the tax changes on the cigarette demand curve (curves) and derive series, which will be called tax revenues curve (curves).

Chart 3. Collected tax revenues at different tax rates by parity prices in the conditions of different countries' demand curves

Tax per unit/piece AMD	Mln dram			
	Turkey	Indonesia	Estonia	China
4.95	22,681.00	22,681.00	22,681.00	22,681.00
5.87	26,044.88	25,319.08	26,440.14	24,369.43
6.88	29,445.56	27,659.71	30,418.12	25,323.04
7.98	32,823.82	29,555.26	34,603.84	25,278.58
9.20	36,101.28	30,818.62	38,978.16	23,906.63

10.55	39,175.77	31,213.99	43,511.65	20,796.60
12.02	41,915.51	30,445.78	48,161.79	15,438.48
13.64	44,152.19	28,144.97	52,869.53	7,200.69
15.43	45,672.32	23,852.58	57,555.09	
17.39	46,206.80	16,999.54	62,112.71	
19.55	45,418.14	6,882.20	66,404.35	
21.93	42,884.97		70,251.85	
24.54	38,083.04		73,427.38	
27.42	30,362.22		75,641.84	
30.58	18,918.51		76,530.63	
34.06	2,759.95		75,636.26	
37.88			72,387.31	
42.09			66,072.64	
46.72			55,810.08	
51.81			40,508.42	
57.42			18,821.04	

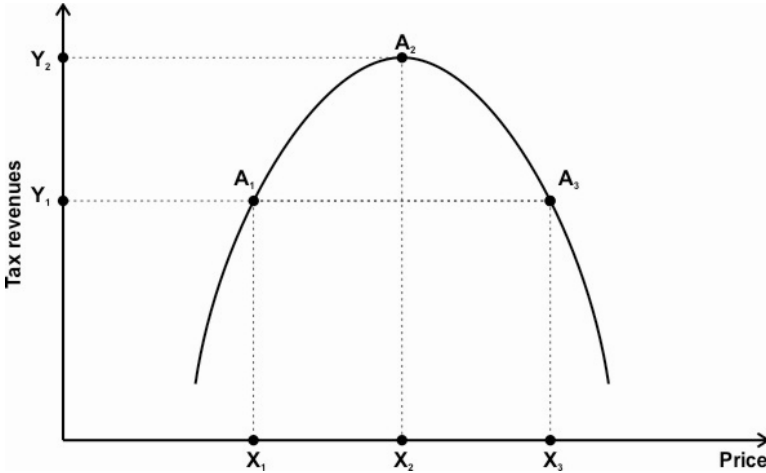
Figure 7. Tax revenue curves



In the aforementioned Figure the curves have been in fact derived through comparison of respective indicators of Armenia with indicators of several countries, i.e. all 4 curves reflect various estimations of changes in tax revenues in case of potential increase in cigarette prices (only the price increase due to tax increase is considered here, see Assumption 2), which can be valued as optimistic (Estonia) and conservative (China).

It is obvious with all scenarios that tax revenues will grow even in case of doubling the increase of tax burden.

Figure 8. Lorentz curve for cigarette



Depending on what principle is pursued by tax policy, two proposed scenarios are possible for tax increase (base point X_1).

5. To ensure maximum tax revenues it is necessary to approach point A_2 , which secures Y_2 maximum revenues given the X_2 price;
6. From public health perspective it can be suggested to increase prices up to X_3 (or define it within the X_2 - X_3 interval). In this case with equal or higher income level we'll have higher price, hence less smokers.

If we apply the above-mentioned to Armenia, we will get the following table.

Chart 4. Levels of tax rate changes for Armenia that ensure tax revenue growth by different cigarette demand curves and policy goals

	Conservative scenario	Medium scenario	Optimistic scenario
Perspective of tax revenue maximization	200 percent	350 percent	600 percent
Public health perspective	310 percent	620 percent	1100 percent

Estimations made on the basis of theory and experience of other countries in fact evidence that increasing the rate of tax charged from 1000 cigarettes in Armenia from

the current 5000 drams to 10000 drams is the least that can be done to enable us to take a step towards a more effective public health policy along with boosting the state budget revenues.

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