

**Tobacco Control Measures in the Context
of High Poverty: *Economic aspects***

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1. Acknowledgements

Current paper is an output of a joint project with 2003 IPF Fellow Dr. Sevak Lalayan (www.policy.hu/lalayan). Dr. Lalayan's paper is devoted to the same problem with major focus placed on the policy advocacy aspects of the problem.

The author expresses his gratitude to Dr. Sevak Lalayan for his kind co-operation, as well to Dr. Hana Ross, who kindly took the responsibility of the mentor for current research.

2. Methods and Limitations

Data on households' expenditures, particularly expenditures on tobacco have been collected from the relevant survey¹ conducted by the National Statistical Service (NSS). The NSS publications also provided other relevant statistical data which were used to assess smoking prevalence for poverty groups. Confidential tobacco market analysis conducted by a tobacco company in Armenia was used for assessing average retail price for different structural portions of the cigarette market in Armenia. Ministry of Finance and Economy kindly provided relevant tobacco-market related information, not available in statistical reports of the NSS.

We faced several major limitations due to lack of statistics of cigarette and tobacco use. The smoking prevalence had been estimated based on a nation-wide survey² conducted by NSS in 1997. No major polling and surveys had been conducted in Armenia afterwards. The lack of dynamic data series made impossible to assess or estimate several important indicators for tobacco in Armenia, such as demand elasticity for tobacco products, etc. Hence, several internationally accepted models and scenarios have been used and extrapolated for Armenia.

Given the abovementioned limitations, we used several assumptions to go forward with the research and reach the objectives of the current paper.

The basic statistical data used for the current research being available for the year 2001, we cover made all the analyses and research for 2001 year.

3. Background

3.1. Scale of Poverty

The scope of poverty is wide in Armenia. According to the official data more than half of the entire population of Armenia was considered to be under the poverty line in 2001. This data comprised 16% of the population, whose per capita expenditures were under the food line, thus considered as extremely poor. The poverty line and the food line were equal to 12,019 AMD³ and 7,368 AMD respectively in 2001 (21.6 USD and 13.2 USD).

¹ Source: Nationwide Household Survey, 2001; National Statistical Service

² Source: Tobacco Consumption Survey, 1997; National Statistical Service

³ Calculated on the basis of market price of products portion that constitute 2100 calories daily.

Poverty is an issue of highest importance for state policy and several measures are currently being implemented to reduce the poverty in Armenia. A special Poverty Reduction Strategy Paper (PRSP) has been developed with the joint efforts of various researchers and policy makers focused at the poverty reduction mechanisms. The draft PRSP is currently in circulation.

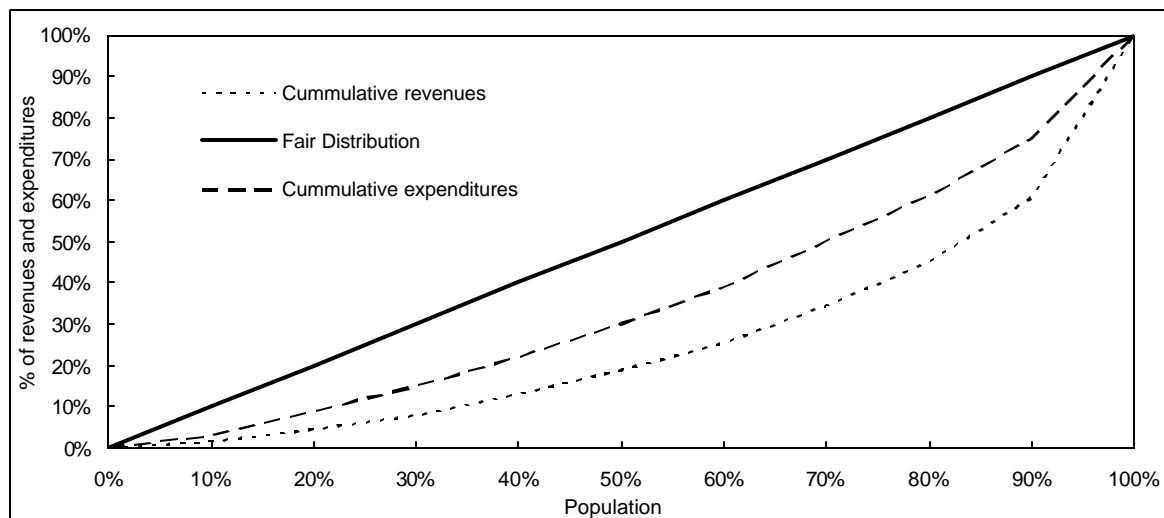
Given the highest urgency of the problem, poverty in Armenia is a subject to wide and large-scale analyses and the statistics is respectively available.

Table 1 shows the distribution of income and revenue by decile groups of population. The data and the chart in Figure 1 indicate the high poverty level and inequality of income distribution in Armenia.

Table 1.

	Poorest									Richest
	10%	20%	30%	40%	50%	60%	70%	80%	90%	10%
Current net expenditures per capita (monthly average, AMD, <i>not adjusted</i>)	3330	5310	6661	7992	9352	10965	13022	15719	20234	37645
Current net expenditures per capita	3.4%	5.3%	6.5%	7.2%	7.8%	9.2%	10.3%	11.0%	13.8%	25.5%
Current incomes per capita (monthly average, AMD)	2,933	5,866	6,648	9,973	11,537	12,710	17,599	20,728	30,505	77,044
Current incomes per capita	1.5%	3.0%	3.4%	5.1%	5.9%	6.5%	9.0%	10.6%	15.6%	39.4%

Figure 1. Lorence curve for Armenia



The Gini coefficient is estimated to be equal to 0.51 in Armenia⁴, which, again, witnesses the high level of inequality of income and revenue distribution in Armenia (see the chart above).

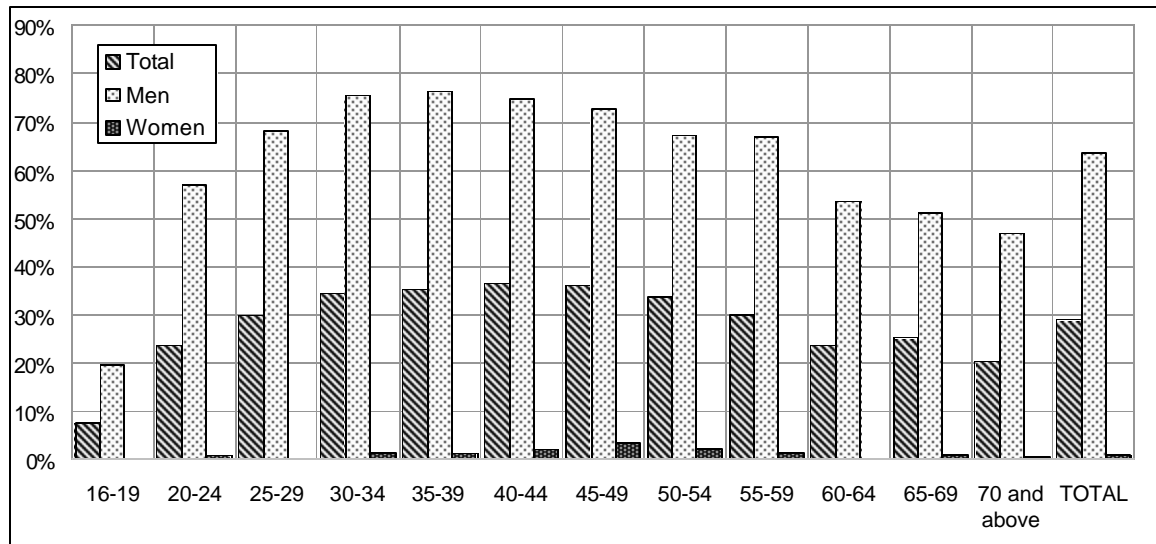
3.2. Smoking Prevalence

As opposed to the data on poverty, the smoking prevalence is not being thoroughly monitored and analyzed. Different surveys show different results. The main

⁴ Economic Growth in Conditions of Fair Distribution of Income; Economic Development Research Center, Yerevan, 2002

discrepancies refer to female and youth smoking prevalence. The widest polling on the subject, as mentioned above, had been conducted in 1997 by the NSS. This survey simply asked whether a person smoked or not, making impossible to distinguish between daily and occasional smoker. The results, although considered as underestimated for women and youth, are evidently quite close to the real situation, as the everyday experience proves extremely high prevalence of smoking of male population and much less for female.

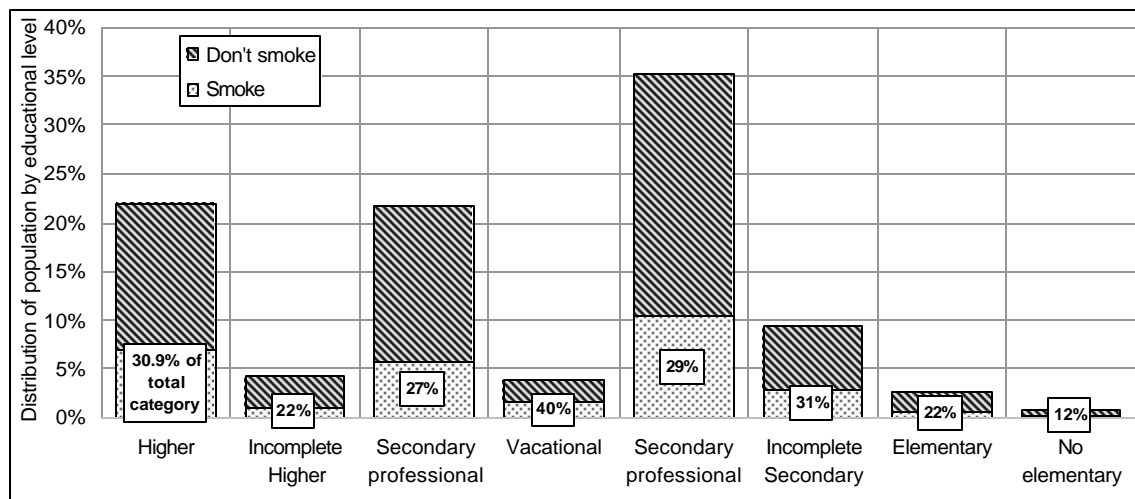
Figure 2. Smoking prevalence by sex and age groups



As it is visible in the Figure 2, data in mentioned survey showed 29% smoking prevalence for entire population, including 63.7% for men and 1.24% for women. Extrapolation of the mentioned results to the adult population (of age 16+) gave respectively 31.2%, 64.6% and 1.3% prevalence figures.

The next chart shows the distribution of smokers by education level.

Figure 3. Smoking prevalence by education level



Evidently, the negative correlation between smoking prevalence and education level is not the case for Armenia.

4. Poverty and Smoking: *dual impact*

4.1. Income elasticity of tobacco products

International experience shows that in most cases poverty and smoking prevalence have positive correlation. It means that in most countries and from country to a country smoking prevalence decreases in parallel with the increase in income level. Estimation of credibility of this statement for Armenia's case is based on the survey results provided by the NSS. The survey shows household's expenditures' structure, including expenditures on tobacco.

Table 2. Consumer expenditures of households by decile groups according to 2001 survey results (monthly average per household member, drams)⁵

Deciles	1	2	3	4	5	6	7	8	9	10
Consumer expenses	3330	5310	6661	7992	9352	10965	13022	15719	20234	37645
<i>of which</i>										
food	2676	4119	5091	5947	6663	7783	8925	10396	12261	18845
tobacco	202	336	336	458	568	621	815	913	1097	1392
Tobacco expenditures to total	6.07%	6.33%	5.04%	5.73%	6.07%	5.66%	6.26%	5.81%	5.42%	3.70%
Tobacco expenditures to food expenditures	7.54%	8.16%	6.60%	7.70%	8.52%	7.98%	9.13%	8.78%	8.95%	7.39%

According to the data represented above in average more than 5.5% of total consumer expenses are used to purchase tobacco products, which constitute more than 8% of expenditures for food. This ratio is one of highest in the world!

The consumer expenses above, when extrapolated to the overall population, do not match the gross consumer expenses figure provided by the official statistics and do not represent the actual poverty level (for example the poverty line equal to 12,019 AMD is reached in 7th decile group, which means that about 70% of population is below the poverty line). The data with adjusted expenditures structure by decile groups, where the proportion of expenditures between decile groups is kept the same as in Table 2, are represented below. It is possible that some of the "missing" expenditure can be attributed to smuggling, but we have no data available to adjust for this activity.

Table 3. Adjusted expenditures on tobacco by decile groups (monthly average per household member, drams)

Deciles	1	2	3	4	5	6	7	8	9	10
Expenditures on tobacco	368	612	612	834	1,034	1,131	1,484	1,663	1,998	2,535

4.2. Tobacco Market Analysis

Further analysis of poverty – smoking prevalence interconnection is based on a tobacco market analysis, which is conducted to calculate tobacco average retail price of cigarette pack. Particularly, to calculate how much is the prevalence of smoking in different decile groups, we will calculate average pack price for each of these groups. These calculations are based on a tobacco market analysis for 2001 conducted by a tobacco company for its own marketing needs. The market analyses gave the detailed breakdown of cigarettes market, including all imported and local brands and their

⁵ Source: Nationwide Household Survey, 2001; National Statistical Service

market retail prices and market shares. The calculations showed that the weighted average retail price in 2001 was equal to 289.09 Armenian drams (about 0.52 USD).

To adjust the market data to the poverty groups we made the assumption, that logically the poorer is population, the cheaper brand it consumes. The overall market was divided into 10 price groups each having equal share of the market. Next, cigarette market total turnover was assessed based on the taxation base figures provided by the Ministry of Finance and Economy.

Table 4. Cigarette production and imports volumes (items) ⁶

	1998	1999	2000	2001	2002
Local, with filter	1,565,400,000	1,598,980,000	1,334,510,000	950,880,000	926,960,000
Local, without filter	888,080,000	1,430,950,000	769,600,000	338,050,000	1,761,720,000
Imported, with filter	3,135,090,000	1,079,520,000	1,090,750,000	1,983,790,000	1,691,800,000
Total	5,588,570,000	4,109,450,000	3,194,860,000	3,272,720,000	4,380,480,000

The table above shows the volumes of cigarettes production for local market and imports.

Another attempt to assess the cigarettes retail market volumes is through calculation cigarette resources in the market (local production + imports – exports). The results are similar enough.

Table 5. Tobacco production and trade (items)⁷

	1996	1997	1998	1999	2000	2001	2002
Imports	1,114,940,000	1,248,540,000	3,134,792,000	1,079,480,000	1,135,080,000	2,011,650,000	1,689,650,000
Exports	264,000	-	33,626,000	87,094,000	77,180,000	486,126,000	160,354,000
Production	152,000,000	815,000,000	2,489,000,000	3,131,600,000	2,096,400,000	1,623,000,000	2,815,100,000
Resource	1,266,676,000	2,063,540,000	5,590,166,000	4,123,998,000	3,154,300,000	3,154,524,000	4,344,396,000

Multiplying the quantity figure of cigarettes in the market with the weighted average price will return the cigarettes total turnover amount, which, in this case, is equal to about 47.3 billion of Armenian drams (about 85 million USD) for the year 2001.

Next, having the proportion of monthly average per capita expenditures on tobacco in each decile and multiplying this figure with the number of population in decile will return the total amount of money paid for tobacco in each decile (the sum of these amounts for each decile group would return the overall cigarette turnover volume equal to about 47.3 billion AMD).

To calculate the weighted average cigarette pack price for each decile group, we distributed the overall amount of price groups (starting from the cheapest one) to overall tobacco expenditures in each decile group (starting from the first decile) and calculated the proportions of these distributions.

To calculate the weighted average cigarette pack price for each decile group, we do the following actions: we have cigarette market volume distributed by decile groups and we have the market volume, distributed by price groups. It is obvious that the overall amount paid for tobacco would not be equal for respective price groups and decile groups, given the disproportion of cigarette market structure: the majority of the population smoke cheaper brands, thus, according to our assumption, consuming more cigarettes from lower price groups. For example, we have in Table 6 that population in decile 1 has spent about 1.4 bln of AMD for cigarettes. The volume of 1st price group is accordingly 4.5 bln. This means that, according to our assumption, the consumption for the decile one is entirely covered by the cigarettes

⁶ Source: Ministry of Finance and Economy

⁷ National Statistical Service Publications

from first price group, and, consequently, the weighted average price for the 1st decile is equal to the same indicator of the 1st price group. The same situation is with the second decile group.

The 3rd decile group, according to our estimations and assumption, consumes the remaining 34.4% of cigarettes from the 1st price group and 65.6% of the 2nd price group, which is the next lowest price group. We calculate the weighted average of the prices in 1st and 2nd groups (34.4% with 11.63 AMD and 65.6% with 174.96 AMD) and get the result for the 3rd price group equal to about 153.2 AMD. The same calculation had been conducted for all the decile groups.

Table 6. Scheme of distribution of cigarettes in price groups to population deciles.

Price groups of cigarettes	Weighted average price for each price group (AMD)	Total volume of each price group (AMD)	Decile groups	Total amount spent on cigarettes in each decile group (AMD)	Weighted average price for decile groups (AMD)
Group 10	649.35	2,554,465,292	Richest 10%	9,772,697,930	503.53667
Group 9	523.80	4,588,576,544	90%	7,701,616,113	302.17953
Group 8	326.53	4,683,186,370	80%	6,409,822,708	269.39378
Group 7	295.03	4,730,491,282	70%	5,721,802,308	241.75071
Group 6	284.52	4,683,186,370	60%	4,359,802,740	236.38598
Group 5	247.85	4,730,491,282	50%	3,987,710,075	234.74667
Group 4	238.25	5,676,589,539	40%	3,215,442,279	176.4425
Group 3	234.75	6,386,163,231	30%	2,358,927,086	153.1743
Group 2	174.96	4,683,186,370	20%	2,358,927,086	111.62935
Group 1	111.63	4,588,576,544	10%	1,418,164,498	111.62935

Next, based on the survey of NSS we have the amount of cigarettes, smoked daily by average smoker.

Table 7. Average daily consumption of cigarettes⁸

Average daily consumption, items	5	10	20	30	40	packs	items
Total	6.2%	15.4%	61.3%	7.3%	9.8%	1.035	20.22
men	5.4%	15.1%	62.2%	7.3%	10.0%	1.046	20.41
women	37.9%	29.1%	25.2%	6.8%	1.0%	0.616	12.29

4.3. Smoking prevalence

The available data on cigarette daily consumption and average price of a pack consumed in each decile will allow assessing the smoking prevalence of the population by decile groups of population⁹.

Table 8. Smoking prevalence assessment for population decile groups

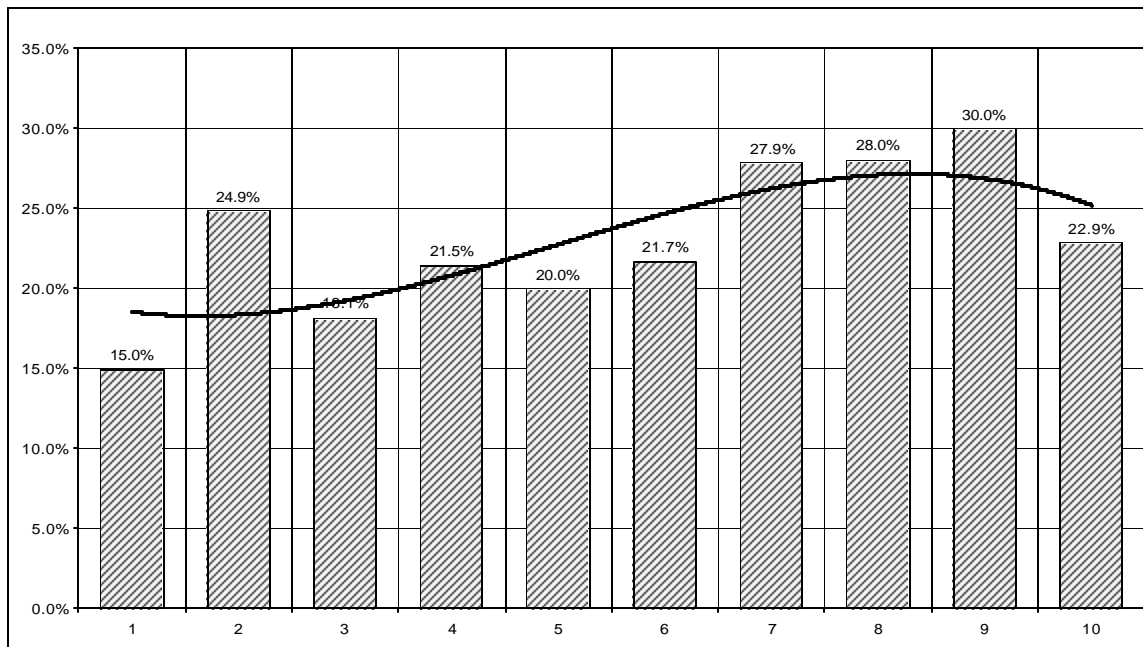
		Decile groups 10%	20%	30%	40%	50%	60%	70%	80%	90%	10%
1	Adjusted expenditures on tobacco per capita, per month, AMD (adjusted data)	368	612	612	834	1,034	1,131	1,484	1,663	1,998	2,535
2	Average price per pack (our calculations)	111.63	111.63	153.17	176.44	234.75	236.39	241.75	269.39	302.18	503.54
3	Annual amount spent on tobacco, mln AMD (population in decile x [1])	1,418	2,359	2,359	3,215	3,988	4,360	5,722	6,410	7,702	9,7730
4	Average smoker smokes per day, items (NSS data)	20.22	20.22	20.22	20.22	20.22	20.22	20.22	20.22	20.22	20.22
5	Amount paid by an average smoker, per year ([2] / 20 * [4] * 365)	41,193	41,193	56,524	65,110	86,625	87,229	89,2104	99,410	111,509	185,813

⁸ Source: Tobacco Consumption Survey, 1997; National Statistical Service

⁹ Our calculations show the absolute number of smokers in each decile group. These calculations have a proviso that a smoker consumes 20.22 packs of cigarettes per day.

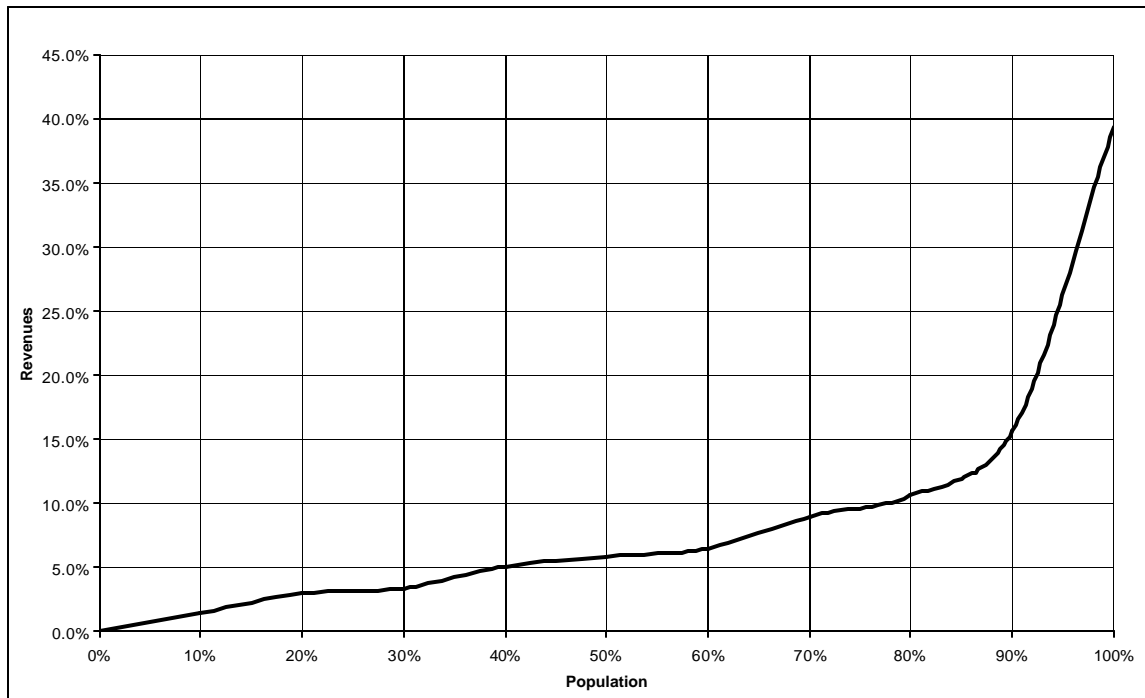
6	Smokers per decile ([3] / [5])	34,427	57,265	41,733	49,385	46,034	49,981	64,139	64,478	69,067	52,594
7	16+ population (71 % of population of a decile)	230,115	230,115	230,115	230,115	230,115	230,115	230,115	230,115	230,115	230,115
8	Smoking prevalence for 16+ population (% of [6] in [7])	15.0%	24.9%	18.1%	21.5%	20.0%	21.7%	27.9%	28.0%	30.0%	22.9%
9	Smoking prevalence (% of [6] in population in a decile)	10.7%	17.8%	13.0%	15.4%	14.3%	15.6%	20.0%	20.1%	21.5%	16.4%

Figure 4 Estimated smoking prevalence for decile groups of population (16+ population)



The average prevalence data for 16+ populations, according to our estimations, is 23%, which is less than 31.2% ratio calculated by the NSS. The difference may be a result of incorrect assessment of tobacco market volume and usage of too many assumptions during the calculations. Figure 4 indicates that the smoking prevalence rises from 1st decile group (the poorest population) up to the 9th one and then it starts to fall. The curve of non-cumulative distribution of revenues indicates that the last decile group owns much more portion of revenues than the previous one (see below).

Figure 5. Non-cumulative distribution curve of revenues



The mentioned fact can explain the reason, why the smoking prevalence starts to fall for last decile group. The widely recognized tendency, which proves that, based on international experience, the higher are the incomes of population, the less they do smoke starts to show itself only for the last decile group of population. We assume that the reason why the poorer population in the first deciles smokes less is just because people do not have the minimal amount of money to spend on tobacco. They could also, probably, given the extremely low income level, smoke few cigarettes per day, thus being ignored while estimating the smoking prevalence by poverty groups.

The research results show an important fact: smoking prevalence is less for those population groups, who are below the poverty line. This fact, nevertheless, does not mean that the urgency of the problem is less crucial for the poverty groups. Just in contrary. Recognizing the different utility value of same expenditures for different groups of population (besides, the share of tobacco expenditures is higher for poor populations, see Table 2), we will prove that smoking has much more negative impact on poor population, than on wealthier one (leaving aside the harm of smoking on public health).

4.4. Cost of smoking

The poverty level (poverty line) is calculated on the basis of daily portion of calories, equal to 2100, necessary for an organism of an individual to maintain his health, multiplied with a coefficient of expenditures on minimal non-food products and services. A person is perceived as poor, when his monthly expenditures are below the amount of money needed to buy these calories in the form of different food products plus the minimal set of other products and services. A person is perceived as very poor, when his overall expenditures are below the food line, which is calculated as the amount of money needed to purchase solely the basket of food products having the mentioned 2,100 calories.

Money expenditures on tobacco spent by a smoker are also included in the overall expenditures. So, formally, a person, spending less than 12,019 drams per capita per month is considered to be poor regardless the fact if she or he spends this amount of money on cigarettes also or not. On the other hand, if we perceive the phenomenon of poverty as impossibility to acquire the necessary quantity of goods and services that are crucial for maintaining the minimal quality of life. This means, obviously, that the “real” poverty is estimated on the basis of utility of purchased goods and services, rather than the amount spent on these products.

Tobacco can hardly be considered as a product which is adding to the utility of product’s basket purchased by an individual, nor can it be claimed to bring any use to the smoker. With this regard tobacco expenditures are to be excluded from the amount of individual’s expenditures which are laid as the basis for calculating poverty level.

Having the proportion of tobacco expenditures in overall, it is easy to construct the new, “adjusted” curve of non-cumulative distribution of expenditures, which will indicate the “real” (not formal) level of poverty.

Now, let’s suppose that the expenditures on tobacco are being spent on other, “useful” products, such as food, health care services etc.

As it was mentioned above, the poverty line is being calculated based on the daily portion of calories necessary for a human organism to survive. The food products that constitute these calories are defined and published in statistical reports. The one for 2001 is presented below:

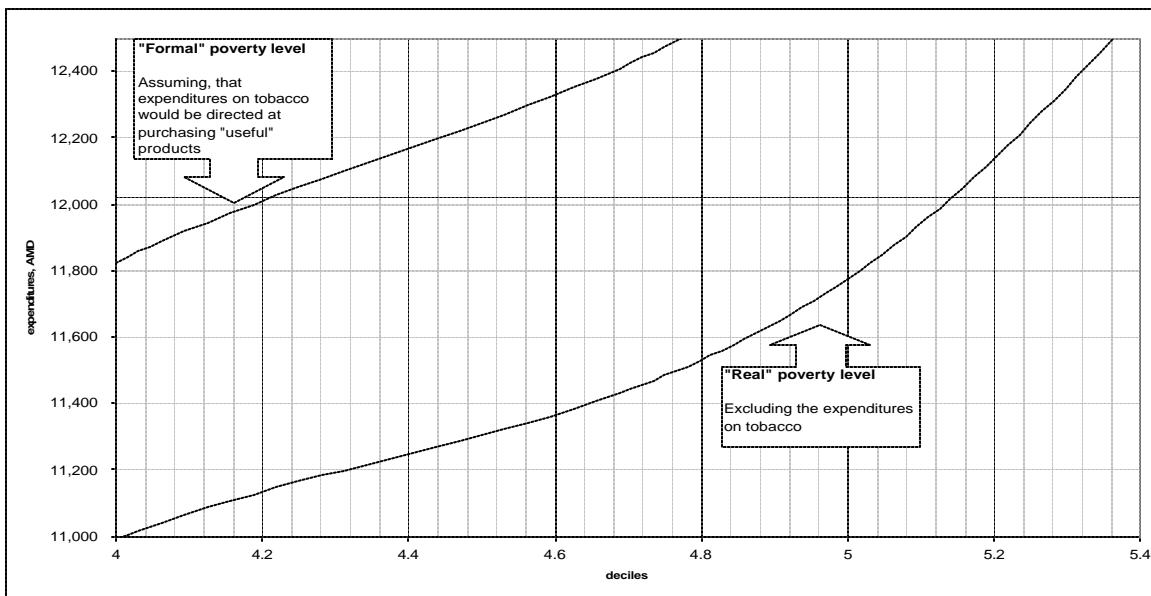
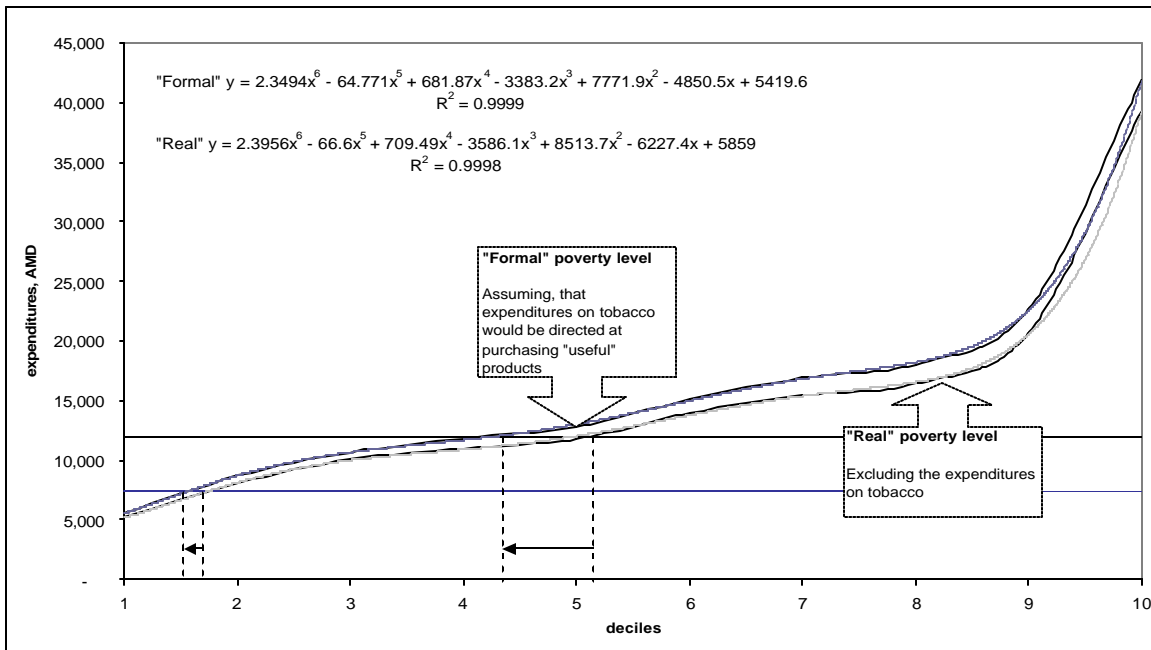
	Daily consumption per capita, grams	Food energetic, kkal	Food basket energetic structure, %	Price per g, AMD ¹	Price
Rice	17.19	71	3%	0.38	6.46
Leguminous plant	18.03	44	2%	0.16	2.86
Wheat flour	19.64	67	3%	0.31	6.08
Wheat bread	427.39	1124	54%	0.39	166.66
Macaroni products	25.62	89	4%	0.37	9.37
Lavash ¹	28.62	76	4%	0.39	11.16
Beef	17.82	39	2%	1.35	24.10
Poultry	4.07	3	0%	1.14	4.63
Fish products	15	11	1%	0.54	8.03
Milk	27.12	18	1%	0.31	8.33
Yogurt	18.27	14	1%	0.22	4.01
Cheese	12.48	51	2%	1.36	17.03
Eggs	7.6	10	0%	0.49	3.69
Butter	3.46	26	1%	1.83	6.32
Oil	6.53	59	3%	0.64	4.19
Melted butter	19.7	165	8%	1.74	34.31
Apples	44.24	19	1%	0.31	13.72
Grapes	4.96	3	0%	0.85	4.23
Citrus plants	3.3	1	0%	0.63	2.09
Compots ¹	14.92	11	1%	0.15	2.18
Cabbage	45.85	12	1%	0.24	11.17
Onions	12.19	4	0%	0.16	1.99
Potatoes	192.45	115	6%	0.21	40.59
Sugar	16.93	67	3%	0.44	7.41
Total		2100	100%		

Making very simple calculation (we have monthly 7,368 product line value to buy the mentioned 2,100 calories x 30 days) we find the average price of a calorie, which is equal to about 0.12 AMD. Now, if an individual from the first decile group is a smoker, then, according to our estimations and assumptions, he spends on cigarettes about 110 drams per day, or about 3,300 drams per month. If we even make an assumption, that the poor smoker smokes much less than 20.22 cigarettes per day, and calculate the expenditures on tobacco with the smoking intensity of, for example, ¼ pack of cigarettes per day, we will have 825 drams per month. This amount of money could bring some additional 6,700 calories per month, which is higher that 3-days ratio of calories equal to 2,100.

In this case the “real” poverty level, based on real utility of the products basket would be equal to today’s “formal” one. Visually the difference between the “formal” and

“real” poverty calculation methods would be expressed in a shift of expenditures’ non-cumulative curve.

Figure 6, Figure 7. Shifting the poverty level



The arrows indicate the number of people, who would cross the poverty line, if they would not spent money on cigarettes and would buy more “useful” products instead. The mathematical model of the curves allows us to calculate the approximate quantity of these people. The results are: about **220,000** and **52,000** people would cross the poverty and food lines correspondingly.

We would like to once more stress out that the shift in formal poverty line would not happen as the poverty line calculation method does not consider the directions of expenditures. Nevertheless, a huge proportion of population, unarguably would cross the poverty line in real terms, acquiring more utility for their money.

5. Estimating the effect of anti-tobacco measures

The estimations and assessments in the chapters above once more proved the priority of price measures in the sphere of anti-tobacco policy. We will not discuss the possible effects of non-price measures and will focus on government's tax policy as the main lever to impact on smoking in Armenia. This is particularly reasoned by the high poverty level in the country, where the most part of population is expected to be more sensitive to cigarettes price increase.

5.1. Tobacco taxation

Tax burden is not very heavy for tobacco products in Armenia. The "Law of the Republic of Armenia on fixed payments for tobacco products" sets 4 types of taxes for main tobacco products (the rest, such as cigars and cigarillos occupy tiny share of the market and will not be discussed).

The taxation ratios are set as follows.

Table 9. Fixed payment rates

Product Type	Units	Local	Imported
Cigars	USD per 1000 items	2200	3000
Cigarillos	USD per 1000 items	22	30
Cigarettes with filter	USD per 1000 items	8	11
Cigarettes without filter	USD per 1000 items	3.5	6

The fixed payments have unified excise tax, VAT and customs payments in one. The tobacco taxes are regressive in Armenia.

The other peculiarity is the different ratios for imported and locally produced tobacco products. The market sets unfair rules promoting the local industries and local brands.

The real share of taxes in each group had been estimated based on available tobacco market data. The following table shows the proportions of taxes in each group of tobacco products.

Table 10. Tax share in cigarette price

	Tax rate for 50 packs, USD	Average retail price	Price for 50 packs	Tax amount in AMD	Tax share
Imported filter	11.0	284.99	14,249.37	6,105.0	42.8%
Imported non-filter	6.0	101.14	5,056.88	3,330.0	65.9%
local filter	8.0	277.30	13,864.91	4,440.0	32.0%
local non filter	3.5	117.81	5,890.74	1,942.5	33.0%

An important fact here is that local brands, which are cheaper, have lower portion of taxes. So the tax legislation appears to be progressive from one price group to another (although the taxes are not *ad valorem*), as the share of taxes in a cigarette pack consumed by a poorer population could be lower than this share in more expensive imported brand. This comes to prove that the tobacco products' taxation strategy does not have a special focus to the poor population.

5.2. Demand elasticity

As it was discussed above, the demand elasticity can not be estimated for tobacco products, given the lack of relevant statistical data series. On the other hand, we have to apply a model of such elasticity to measure the possible outcomes of stricter tax policy. Hence an extrapolation of common models for countries with small and

medium income, where it is advised to assume the demand elasticity is equal to -0.8^{10} , will be performed. Moreover, as we deal with groups of population with different income level, starting from poor ones to the richest, we will try to apply different elasticity coefficients to different decile groups. A basis for it would be an assumption, that the demand elasticity for richest group is -0.4 , as for the wealthier countries. The decile groups in interval between the poorest and the richest ones, according to our assumption, obtain elasticity coefficients according to the index of the average income level in the concrete decile group.

Table 11. Calculation of demand elasticity coefficients for decile groups of population

	1	2	3	4	5	6	7	8	9	10	Average for entire population
Demand elasticity coefficient	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.6	0.4	0.7

5.3. Suggested scenario

Having calculated the portion of taxes in average pack and assuming that the demand elasticity for tobacco products is equal to -0.7 in Armenia, we can estimate a possible outcome of policy measures, directed at 10% price increase of tobacco products.

The weighted average retail price of a pack of cigarettes is calculated to be equal to 289.09 drams¹¹. In order this price to reach 317.99 drams, i.e. increase by 10%, we considered a number of scenarios of amendments in taxation legislation. These changes have been intended to fit to the following requirements:

- the taxation rates will be the same for similar products, irrelevant to their origin (thus setting fair rules for all participants of the market);
- the taxation rates will increase for all types of tobacco products.

The calculations showed that the desired scenario of taxation will be as follows:

Table 12. Suggested fixed payment rates

Product Type	Units	Local	Imported
Cigarettes with filter	USD per 1000 items	12.7	12.7
Cigarettes without filter	USD per 1000 items	7	7

In this case, rising the average tax rate by 28.5%, we would have the following shares of taxes in each product group.

Table 13. Fixed payment rates (28.5% tax increase scenario)

	Tax rate for 50 packs	Average retail price	Price for 50 packs	Tax amount in AMD	Tax share
Imported filter	12.7	284.99	14,249.37	7,048.5	49.5%
Imported non-filter	7.0	101.14	5,056.88	3,885.0	76.8%
local filter	12.7	277.30	13,864.91	7,048.5	50.8%
local non filter	7.0	117.81	5,890.74	3,885.0	66.0%

From the public health perspective, however, the preferred alternative would be setting equal taxation rates for all the product groups.

¹⁰ Curbing the Epidemic: Governments and the Economics of Tobacco Control. The World Bank, Washington D.C., USA

¹¹ For the year 2001

5.4. Scenario outcomes: shifting poverty

We will now return to the curve of non-cumulative distribution of expenditures and the theory of “real” and “formal” poverty. Making the same calculations for the scenario of 10% shift in cigarette prices, and, respectively, about 7% of decrease in cigarette consumption, we will have the following quantities of people who would cross the poverty and food lines. It makes about 67,000 people for the poverty line, and about 16,000 people for the food line.

This realistic outcome can be reached if the government adopts relevant strategy, directed to strengthening tobacco control measures. This action may, of course, have other outcomes, which will also be subject for our analysis.

5.5. Other possible outcomes: Fair distribution of revenues

The Gini coefficient, which indicates the fairness of income distribution for the population is estimated to be equal to 0.51 for Armenia. The smaller is the coefficient value (the closer it is to 0), the more evenly is the income distribution. The same is for expenditures. Shifting the whole expenditures curve in the Figure 1 would not result changes in the Gini coefficient. On the other hand, having applied different elasticity coefficients to different decile groups, we can expect a change in Gini coefficient also.

Simplifying the calculations, we estimated the Gini coefficient for expenditures based on the decile groups. The result was 0.4027. Comparing this coefficient with the one calculated for the scenario if there is about 7% less demand in smoking, we have the difference of about 0.16%. This means that in case of possible price increase of tobacco products we will also improve the income distribution.

5.6. Scenario outcomes: macroeconomic aspects

The data provided by the Ministry of Finance and Economy show, that the revenues of the state from tobacco taxes constituted about 25 million US dollars in 2001.

Table 14. Tobacco taxation¹²

	1998	1999	2000	2001	2002
local, with filter (items)	1,565,400,000	1,598,980,000	1,334,510,000	950,880,000	926,960,000
local, without filter (items)	888,080,000	1,430,950,000	769,600,000	338,050,000	1,761,720,000
imported, with filter (items)	3,135,090,000	1,079,520,000	1,090,750,000	1,983,790,000	1,691,800,000
Total (items)	5,588,570,000	4,109,450,000	3,194,860,000	3,272,720,000	4,380,480,000
Amount of taxes (AMD)	5,769,000,000	9,107,000,000	13,066,000,000	13,701,600,000	19,399,400,000

We have already estimated that to rise the weighted average cigarette pack price by 10%, we have to increase the average tax ratio by 28.5%. In this case the weighted average tax share in a cigarette pack would constitute about 41%.

Making simple calculations we calculate the tax revenues volume in case of 10% price increase and 28.8% tax increase, which returns about 8.5 million of US dollars for the year 2001.

Here we would like to make a proviso – in case we calculate the budget revenues from tobacco taxation based on our calculations of average market price of cigarettes instead of using the official figure, we observe 17% discrepancy between these figures. To be consistent in our calculations, we compare the

¹² Source: Ministry of Finance and Economy

revenues subsequent to tax increase with the one estimated on the basis of weighted average cigarette pack price equal to 289.09 drams (in this case the budget revenues are higher from the official figure by about 5 million of USD).

Thus, in our scenario, in the case of increase in average taxation rate by 28.5% and thus creation of conditions for about 7% decrease in cigarette consumption, the budget revenues would have increased by about 8.5 million US dollars, or by about 28%! Quite powerful argument to consider the proposed tax increase.

6. Conclusions and policy recommendations

6.1. Main conclusions of the paper

Smoking brings a lot of harm to the population. It causes major problem with public health and absorbs too much resources which would otherwise be directed at obtaining more “useful” goods with higher utility. The last point is especially true for poor population, who hardly earn minimal resources for making their living. The alternative value of cigarettes for these groups is too high to be underestimated. Each pack of cigarettes is a lost of additional calories, products and services which would add to the living conditions of an individual.

We observed a situation of straight correlation between the level of income and smoking prevalence for the population whose earnings are below the normal level. The higher are the per capita incomes of population, the more they smoke. This kind of irrational correlation can be explained, in line with other explanations, by the assumption, that the characteristics of poverty of population are not the same as in many other countries. The international experience proves that the higher prevalence observed in poorer groups of population is indirectly conditioned by lower education level, which is typical for poor population. In Armenia, as well as in the other former soviet republics, the lower income level does not necessarily mean lower level in education. This phenomenon can be the key in understanding poverty and smoking interrelations.

Summarizing other findings of this research paper, we can state, that:

- Smoking, while bringing a lot of harm to the active and passive smokers, in the meantime worsens the living conditions of the poor people in terms of absorbing scarce resources which would bring more use to the smoker, if spent in other ways;
- Spending the money on “useful” consumer products, instead of cigarettes would shift the poverty line (not formal) for a significant amount of people treated as poor and very poor. “Ideally”, if the entire population would give up smoking, the quantity of people who would cross the poverty and extremely poverty level would reach correspondingly **220,000** and **52,000**.

More realistic approach, meaning 10% increase in cigarette price, would result in such a shift for **67,000** and **16,000** people correspondingly.

- Strict tobacco control measures applied by the government would not have negative impact on state revenues of the country. Just in contrary, increasing price by 10%, which would be done through increasing taxes by 28.5% in average, would create additional revenues equal to 8.5 million of US dollars.

The above mentioned postulates all come to prove that the country would not undergo any harmful impacts caused by stricter tobacco control policy. Leaving alone the reduction in very negative health impact on population, the stricter policy would bring several positive changes to the socio-economic situation in the country, especially to the vulnerable groups of it – the poor.

6.2. Policy recommendation

Based on the outcomes of the current research paper, we will recommend the policy makers to implement the following measures:

- The nature of smoking and its scale is not thoroughly analyzed in Armenia. There is lack of statistics and transparency. The policy makers should pay more attention to this sphere and direct more resources at specific polling and researches concerning the economic and health aspects of smoking.
- Tobacco control measures, especially directed to reduction of smoking in poverty groups, should be included in the Poverty Reduction Strategy Paper as another important item in agenda towards the elimination of poverty and thus be focused at by larger audience and state institutions.
- Government should implement stricter tobacco control policy measures, mainly based on fiscal tools and levers, which prove to be more effective, meanwhile understanding the absence of negative effects of such policy measures.
- Government should sign and ratify to the Framework Convention Alliance, which is already containing necessary policy measures directed at smoking restriction and reduction.