

THE “INVISIBLE HAND” IN CASE OF FOODS WITH high LEVEL OF FAT, SUGAR AND/OR SALT IMPORTANCE OF FAT TAX

*Robert Sandor Szucs, PhD*¹*

College of Szolnok, Hungary

Abstract:

17.5 million obese young persons live in the European Union. Proportion of overweight or obese is more than 60% in Hungary. It causes drastic elevation of the hygienic expenses. It is a fact that foods with high level of fat, salt and sugar are popular among young people, with promoting these products we contribute to childhood obesity. Lack of legislation on market of foods with high level of fat, salt and sugar might lead to success in a short run but only for the producing companies. Profit is realized at the producing companies, but costs are borne nationally as an increased nursing cost of obese children, young and adults. Possible solutions include the introduction of fat tax. A fat tax is a tax or surcharge that is placed upon fattening foods, beverages or individuals. The fat tax aims to discourage unhealthy diets and offset the economic costs of obesity. The fat tax is used in several countries, e.g. in Romania, Denmark, Finland, etc. The introduction of fat tax is supported e.g. by the WHO or the president of U.S. The fat tax in Hungary will be introduced in two steps in September 2011 and January 2012. The fat tax rate in Hungary is too low (ca. 10%). Many experts share this opinion. The “invisible hand” does not work in case of foods with high level of fat, sugar and/or salt, restrictions are necessary.

Key words: Fat tax, obesity, Hungary, marketing, foods with high level of fat, sugar and/or salt

Introduction:

Consuming foods with high level of fat, salt and sugar is more and more popular in Hungary, consuming intensity of these products is high in young's segment. This is a growing trend worldwide. By the results of the segmentation it can be stated that the majority of young Hungarians is an intensive consumer of foods with high level of fat, salt and sugar, do not understand the notations of food labels, and not aware of the signs' meaning on product packages. There are several ways to decrease uncertainty: rethinking legislation, regulation of communication in case of foods with high level of fat, salt and sugar, increasing

*Full name: Róbert Sándor Szűcs Dr., PhD., college senior lecturer, Institution: College of Szolnok, Hungary, Street: Tiszaligetesi sétány 14., City: 5000 - Szolnok, Hungary, Email: szucsrobert@szolf.hu

the price of products with the tax tools, examining the role of parents. As to my opinion the efficient solution roots in the combination of all of these. It is a fact that foods with high level of fat, salt and sugar are popular among young people, with promoting these products we contribute to childhood obesity. Lack of legislation on market of foods with high level of fat, salt and sugar might lead to success in a short run but only for the producing companies. Profit is realized at the producing companies, but costs are borne nationally as an increased nursing cost of obese children, young and adults. Industry estimates from 2009 put the global weight loss and diet management market at 363 billion USD; by 2014, the global market may reach 586 billion USD (Global weight loss and diet management, 2009).

Thinking it over responsibly and rationally it can be foreseeable that the described process is not sustainable and needs intervention, not just in long, but also in a short run. Hence the utmost practical benefit of the paper is that it draws attention to childhood and juvenile obesity, proving high consumption intensity of foods containing high level of salt, sugar and fat, suggestibility of young people in case of these products, measuring the degree of influencing effect by segments.

Childhood obesity

Production and consumption of food with high level of fat, sugar and/or salt are becoming considerable question in the food industry and health care. Effectiveness of ads of food with high level of fat, sugar and/or salt are much more effective than we suppose it. The advertised food is sweet, sweetened corn flakes, snacks, soft drinks. 95% of food advertisements show food with high level of fat, sugar and/or salt on the television (International Obesity Task Force, 2004). More than 75% of advertisements of games, flakes, candies and snacks is scheduled on Saturday morning, primarily on the channels for children (Macklin, 2003). In the report of International Obesity Task Force (2005) it is published that the level of childhood overweight and obesity is shown to be accelerating rapidly in some countries. It means that 17.5 million overweight children live in the European Union (Fülöp, 2009). The increasing consumption of food with high

level of fat, sugar and/or salt contributes to the drastic increasing of the number of overweight and diabetes type 2 people. The prevalence of obesity has increased 100 percent in the last 20 years (Flegal, 2002). Centers for Disease Control and Prevention published in 2004, that 64 percent of U.S. adults are either overweight or obese (CDC, 2004). The increased rate of obesity is alarming, given the association between obesity and many chronic diseases, including type 2 diabetes; several types of cancer, musculoskeletal disorders; sleep apnea (Must et al., 1999; Field et al., 2001; Visscher, Seidell, 2001). There is a simple relationship between obesity and costs: rising rate of obesity means rising costs. The direct medical cost of obesity and indirect economic loss to obesity has been estimated to be as high as 51.64 billion USD and 99.2 billion USD in 1995 (Wolf, Colditz 1998). The direct costs of obesity are estimated about 7% of total health care costs (110 billion USD) in 1999 in the United States (Finke, Huston 2007). The direct cost rose to 61 billion USD and the indirect cost rose to 117 billion USD in 2000 (Wellman, Friedberg 2002). The indirect cost value is 123 billion USD in 2003 (Endocrine Society and Hormone Foundation 2008). The direct cost of obesity is raised by 9.1% of total health care costs in 2006. The direct cost of obesity was 147 billion USD in 2009. An analysis of projected health care costs has revealed that by the year 2018, obesity-related medical expenses will top 344 billion USD (Huff, 2010).

I should also mention the drastic increase of health expenses caused by overweight and obesity, because recently it has become the most pressing health and almost a non-financeable economic problem. Today the risk of obesity is a bigger problem than smoking or alcoholism. In 1998 Kelly Brownell, director of Yale's Center for Eating and Weight Disorders have told the Boston Herald: "To me, there is no difference between Ronald McDonald and Joe Camel. We need to start thinking about this in a more militant way." (Brownell 1998, Rossin 1998). It is a fact that the average health care cost of overweight persons is higher with 42% than the normal bodyweight ones (Finkelstein, 2004). In particular, the average annual medical bill for an overweight person is estimated to be \$732 higher than for a person of normal weight (Loureiro, Nayga 2005).

Nearly 7 people die of obesity or from complications of obesity in Hungary each hour - one every 9 minutes. The unnecessary kilos play important role in death (Halmi, 2010). Secondary surveys confirm that the children will follow the family's consumption patterns. We have to recognize that obese children become obese adults. The incomplete knowledge contributes to serious problems especially in the case of increasing consumption of food with high level of fat, sugar and/or salt. In this case the increasing consumption of these products can contribute to the drastic rise in the number of overweight and diabetes type 2 people. The high intensity of consumption affects the family budget and the budget of the country. Importance of the problem can be measured. The health care costs caused by obesity rise dramatically. WHO projects that approximately 2.3 billion adults will be overweight and more than 700 million will be obese by 2015. The number of overweight person is more by 700 million and in case of obese is more by 300 million persons than in 2005 (WHO, 2008). The obesity rate around the world reached 60% among the entire population. Obesity rate among adults has risen 30% in the USA. 60 million Americans over the age of 20 are obese (Costley, Leggett 2010). Childhood obesity is problem around the world. 15.2% of 2- to 5-year-old children are overweight, whereas 6.3% are obese in Canada. (Olstand, McCarger 2009) Canada has one of the highest overall childhood obesity rates among nations in the Organization of Economic Cooperation and Development (UNICEF Innocenti Research Centre 2007). The magnitude of overweight ranges from 9% to 27.5% and obesity ranges from 1% to 12.9% among Indian children (Rajaat et al, 2011). Detailed data of Hungary can be found in Table 1.

Table 1.: Distribution of population according Body Mass Index (BMI), gender and age in Hungary

BMI category	Men			Total	Women			Total
	Age 18-34	Age 35-65	Age 65-		Age 18-34	Age 35-65	Age 65-	
Underweight	3.0	0.6	1.4	1.5	11.3	3.0	1.9	4.9
Normal	55.9	29.6	28.9	37.7	67.4	39.8	32.1	45.2
Overweight	29.8	45.0	39.8	39.4	14.9	34.2	42.1	31.1
Obese	11.3	24.8	30.0	21.5	6.4	23.1	23.8	18.9

Source: Hungarian Central Statistical Office, 2009

Nowadays there are serious consequences of rising obesity rate and increasing of health care costs. Problems will multiply in the near future if supporting actions will be not taken. Robert Creighton wrote in 2010: *“In 1789, Benjamin Franklin opined: “In this world nothing can be said to be certain, except death and taxes.” In 2009, Franklin’s age-old adage appears to be in need of revision. Today, there may very well be three certainties in American life: death, taxes, and obesity.”* (Creighton 2010, Willette, 2007). The statement can be true all over the world.

Fat tax

Food with high level of fat, sugar and/or salt ensures high income and profit for the producers, but the expenses of obesity have to be covered by the national economy. It is not surprising that more and more countries do not want to finance the additional expenses of unhealthy nutrition. The popularity of fat tax is increasing in more and more countries that are against of food with high level of fat, sugar and/or salt. Fat tax aims to decrease the consumption of food that are linked to obesity. Possible solution of increasing obesity rate can be the introduction of fat tax. A fat tax is a surcharge placed upon fattening foods and sugar-sweetened beverages with the aim of discouraging their consumption (Goulao, Perez-Barahon 2011). In war of childhood obesity it is a possibility to introduce fat tax. We can state that introduction of fat tax is not a perfect answer to childhood obesity but it can be effective means. Idea of fat tax is not a new initiation. Fat taxes have existed since the 1920s (Creighton, 2010). So, taxes on foods with high level of fat, sugar and/or salt content are not new. The mechanism of fat tax is very simple. Of course consumption of food with high level of fat, sugar and/or salt cannot restrict or ban, but consumption of lower fat, sugar, salt content foods can be urge. If the consumer would like to not decrease the consumption of foods with high level of fat, sugar/or salt than the consumer have to compensate the cost of his obesity. If the consumer eats more unhealthy foods have to pay more fat tax. Payment of more fat tax covers the probable health expenditures. The fat tax aims to discourage unhealthy diets and offset

the economic costs of obesity. The fat tax is used in several countries, e.g. in Romania, Denmark, Germany, Finland, several states of USA, New Zealand, etc. The opportunity of introduction is examined in Great Britain and in France, too. Taiwan plans the fat tax's introduction in 2011. Taxing unhealthy food might avert around 2300 deaths per annum, primarily by reducing salt intake. Taxing a wider range of food (food with high level of fat, sugar and/or salt) could avert up to 3200 cardiovascular deaths in the UK per annum, it is a 1.7% reduction. (Mytton et al, 2007). Half of the states in the United States have already imposed taxes or restrictions on foods with high level of sugars or fats (Chouinard et al, 2007). Approximately 40 states have adopted sin taxes on sugary sodas and juice drinks, with several other states now attempting to do so (Creighton, 2010). The tax rate is different, e.g. in Denmark the tax is DKK 16 (EUR 2.15) per kg saturated fat in food products if the content of saturated fat exceeds 2.3% (Gwozdz, 2011). The proposal was DKK 13 (Elstrand, Nilsson 2010). The fat tax rate in Denmark is ca. 17%. The fat tax in Hungary will be introduced in two steps in September 2011 and January 2012. In Hungary the tax rate varies for each product (5 HUF per liter in case of soft drinks, 250 HUF in case of energy drinks, in case of sweets, sweet pastry, ice cream and chocolate 100 HUF per kilogram, in case of potato chips 200 HUF per kilogram, 200 HUF in case of stock cube and flavoring, fast food restaurants would not be subject to the new tax.) Omission of fast food restaurants is defect. It is estimated that the law would generate as much as 111 million Euros.

The size of fat tax rate is very important because the consumption of foods with high level of fat, sugar and/or salt is inelastic. If fat tax rate is too low than consumption would not decrease. Chouinard et al. have stated that even a 10 percent ad valorem tax on the percentage of fat would reduce fat consumption by less than a percentage point (inelasticity), so fat tax is an effective means to raise revenue. (Chouinard et al, 2007.) French have stated: "Food pricing and marketing practices are therefore an essential component of the eating environment. Price reduction strategies promote the choice of targeted foods by lowering their cost relative to alternative food choices. Price reductions of 10%,

25% and 50% on lower fat snacks resulted an increase in sales of 9%, 39% and 93%, respectively, compared with usual price conditions.” (French, 2003). In case of price reduction of 10% we can state that the small change in price determines small change in consumer behavior. So, if the fat tax rate is small than the consumption of foods with high level of fat, sugar and/or salt would not decrease. The fat tax rate in Hungary is ca. 10%. I can state that the fat tax rate is too low in Hungary; it will not achieve the effect. It increases only the budget revenues. A 2005 US study also confirm my statement. According to study a 10% fat tax on dairy products would not lead to significant reduction in fat consumption (Novak, 2009). Duffey et al. estimate that an 18-percent tax on these foods would result a decline of roughly 56 calories per person per day. These declines would amount to weight loss of approximately 5 pounds per person per year, with corresponding reductions in the risk of obesity-related diseases (Duffey et al., 2010). If the price elasticity of soft drinks were about the same as that estimated for cigarettes, about -0.4 , a 5% tax would result in a 2% decline in sales. (Jacobson, 2000, Lewit, 1982). Numerous studies suggest that as the price of a food increases, consumption of that food decreases². Measure of fat tax is unequivocal. Most authors and studies propose to increase taxes about 20% in case of unhealthy food. The use of the extra incomes shows two directions characteristically. According to the first principle the extra profit must be devoted to public health care. While the other guideline recommends a parallel reduction of tax content of the healthy food.

Aim and methodology

In my researches I examined the consumer behavior of young people with an online survey especially in connection with fat tax. In this survey 504 questionnaires were filled in Hungary. The online questionnaire was promoted in different forums: social media, Facebook, iwiw, Neptun, etc. Taking part in the research for respondents were voluntary and anonym without any previous selection. Inquiry of the online survey happened between 27th April 2011 and 1st June 2011. Anyone could participate in the survey who filled in the questionnaire.

² http://en.wikipedia.org/wiki/Fat_tax, Downloaded: 20. July 2011.

The online survey was country-wide. Distribution of the sample by gender: 60 % women, 40 % men. Average age in the sample ($\bar{x} \pm \sigma$) 27.29 ± 10.099 year, range (R) 14-65 year, modus 20-24 year.

During data procession I used statistical methods (mean, median, deviation, Cramer V statistics, Kendall's rank correlation, crosstabs etc.) with the help of SPSS 14.0 program and Microsoft Excel 2010. I continued my descriptive researches with simple statistical methods, I used Cramer's V statistics for examining correlation among criteria. Kendall's rank correlation (Kendall' W) can be used for assessing agreement among respondents. Kendall's W ranges from 0 (no agreement) to 1 (complete agreement).

Hypothesis and Results

During my research I have examined the consumers' behavior regarding unhealthy foods (foods with high level of fats, sugar and/or salt) in detail, their opinion of body type, obesity and preconception on fat tax. In this paper I have 3 hypotheses:

- 1.) *It is a very important question how the respondents think about their own body type. According to desk researches I assume that the respondents underestimate their own Body Mass Index (BMI).*

I asked the respondents to classify their own body type. Later I could calculate the BMI of the respondents according to their weight and height. Detailed data can be found in Table 2.

Table 2: Body type according to BMI and own opinion of respondents

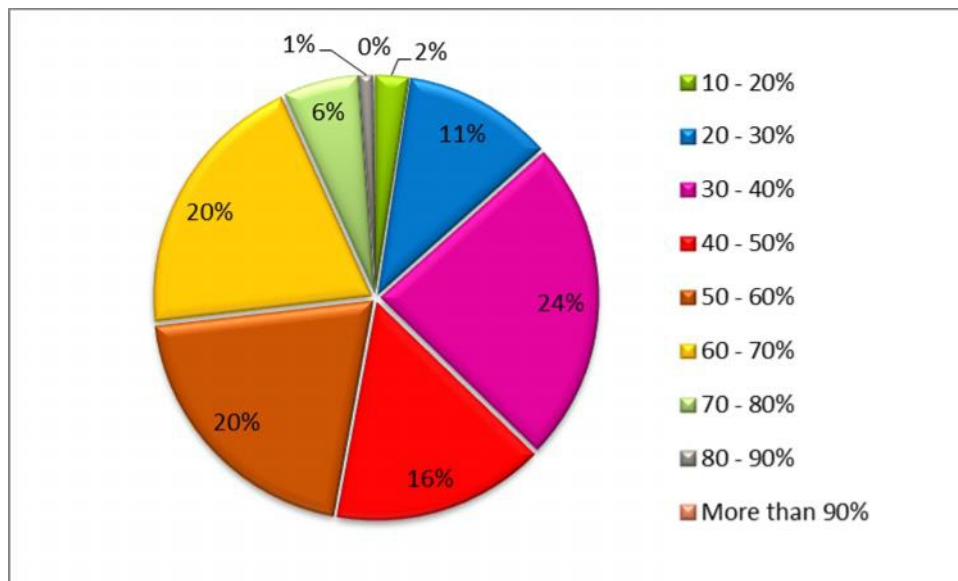
		Body type according to the own opinion of respondents				Total
		Underweight	Normal	Overweight	Obese	
Body type according to BMI	Underweight	22	11	19	2	35
	Normal	24	266	19		309
	Overweight		48	48	2	98
	Obese		1	40	8	49
Total		46	326	107	12	491

Source: own research, 2011

The Cramer's V coefficient, which measures the relationship between body type according to BMI and own opinion of respondents was middle: 0.511. If the consumer responds rationally, then the value of Cramer's V would be 1.00. We can state that the respondents do not know all about their own BMI, so they underestimate the risk of obesity. 89 persons (48+1+40) underestimate their own body type. This is marked with red color.

I asked the respondents to give their opinion about the obesity rate in Hungary. Detailed data can be found in Figure 1.

Figure 1: Obesity rate in Hungary according to the opinion of respondents



Source: own research, 2011

I can state that the respondents underestimate the proportion of obesity. 24% of the respondents think that obesity rate can be found between 30% and 40%. 71% of respondents believed that obesity rate is less than 60%. Their opinion is not correct. Only 20% of the respondents think correctly, that obesity rate in Hungary is between 60% and 70%. The risk will multiply in the near future. 46,1% of the respondents do not do any sport. The inactivity of population is a negative trend. 33.1% of respondents think children are treated by obesity principally. Just 5% of respondents are of the belief of eating healthy but most of

respondents (93%) know the effects of obesity. The word cloud of obesity' consequences according to respondents can be found in Figure 2.

Figure 2: Word cloud of obesity' consequences



Source: own research, 2011

Long-term prospective studies have demonstrated 8 diseases to be definitively associated with obesity: coronary artery disease, stroke, hypertension, colon cancer, postmenopausal breast cancer, type 2 diabetes, gall bladder disease, and osteoarthritis (Katzmarzyk, Janssen 2004).

I can justify my first hypothesis according to the results of Cramer's V coefficient, standardized residuals and obesity rate in Hungary according to the opinion of respondents. I can state that respondents underestimate the risk of obesity but they know the consequences.

2.) *It is a very important question how the respondents think about fat tax.*

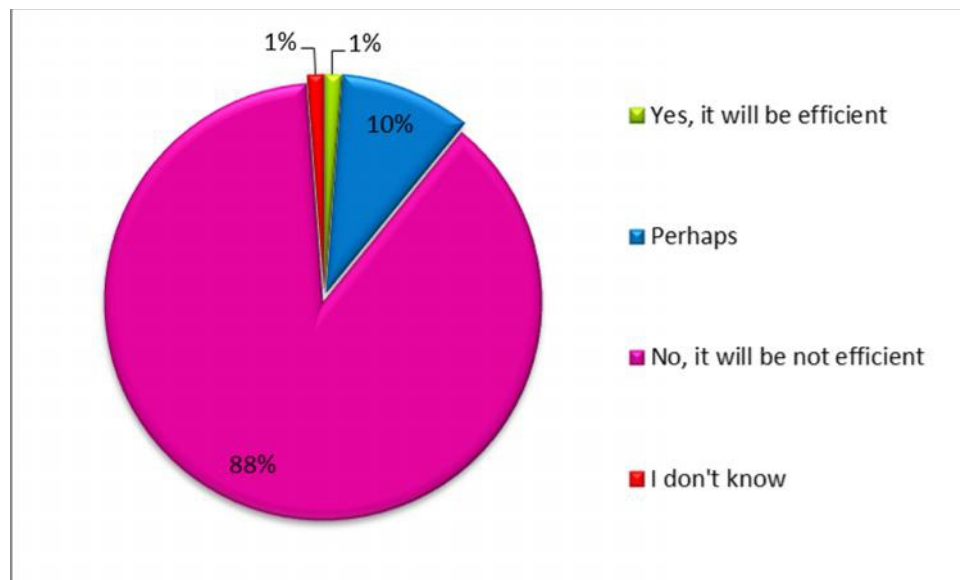
According to desk researches I assume that the respondents refuse the introduction of fat tax.

Fat tax could bring an unobtrusive (but considerable) change in the reform of food consumption's structure. It is indicative of the question's importance that this news is published in 2010. January by CBS News: *A CBS News poll from January 2010 reported that a tax on items such as soft drinks and food considered to be junk food, supported by President Obama and some Democrats*

in the Senate, is rejected by Americans by a margin of 60% to 38%. An even larger number, 72% of Americans, also believed that a tax would not actually help people lose weight. (Montopoli, 2010).

Rejection rate of fat tax is similar in Hungary. 16.5% of respondent do not have any information about the new tax and 61.2% reject the introduction of fat tax. We can suppose that consumers who drink coke often, eat more hamburger or chips often would say no to fat tax. Our assumption does not justify the fact. The value of Cramer's V is 0.219 in the case of coke, 0.149 in case of fast foods and 0.115 in case of chips. The rate of rejection does not depend on the consumption intensity of foods with high level of fat, sugar and/or salt. Rate of rejection would be 14.2% if tax content of healthy foods would decrease parallel. In this case fat tax would be accepted by 85.8% of the respondents. It is a very important question how the respondents think about the efficiency of fat tax. Detailed data can be found in Figure 3.

Figure 3: Efficiency of fat tax in Hungary according to the respondents



Source: own research, 2011

- 3.) *The fat tax rate in Hungary is ca. 10%. I can state that fat tax rate is too low in Hungary; it will not achieve the effect.*

The size of fat tax rate is a very important question because the consumption of foods with high level of fat, sugar and/or salt is inelastic. If fat tax rate is too low, than the consumption would not decrease. In my research I have examined the consumers' price acceptance. I examined what is the point where consumption of foods with high level of fat, sugar and/or salt will decrease. So, I can measure how much fat tax rate is needed to reduce consumption according to respondents. Detailed data can be found in Table 3.

Table 3: Fat tax rate where consumption of foods with high level of fat, sugar and/or salt will decrease according to own opinion of respondents

	Fat tax rate where consumption will decrease in case of different products			
	Coke	Chips	Chocolate	Fast foods
Average	17.3%	16.3%	29.5%	32.3%
Mode	25.8%	22.7%	37.5%	50.0%
Median	21.2%	18.2%	29.8%	32.4%

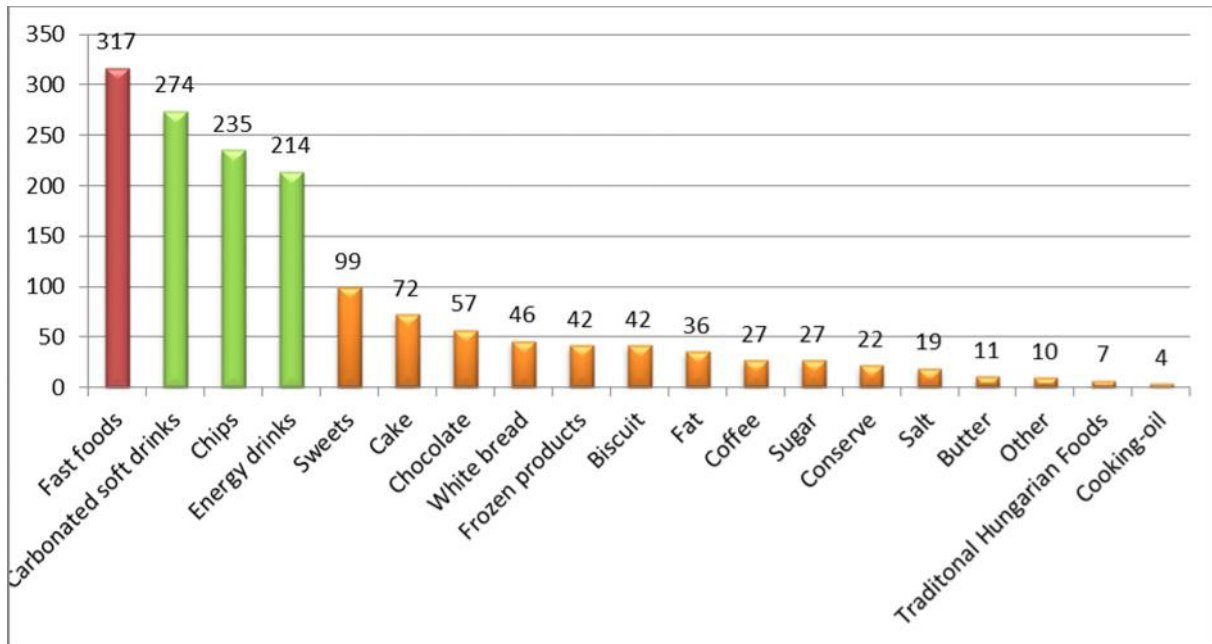
Source: own research, 2011

The fat tax rate in Hungary is ca. 10%. We can state that the level of agreement is high, fat tax rate in Hungary is too low. It is excellently visible from the value of average, mode and median. We may examine the agreement indicator of the consumers. Kendall's W can be calculated from these figures. Kendall's W can be used for assessing agreement among the 504 respondents. The value of Kendall's coefficient of concordance is 0.92 (92.0%). The value "92%" refers to the nearly complete agreement between the respondents. So, I can state that the fat tax rate in Hungary is too low. 92% of respondents agree with my statement totally. Also many experts share this opinion.

Respondents propose to levy tax on foods with high level of fat, sugar and/or salt in a wider range. The bill passed by Parliament contains some product, e.g. carbonated soft drinks, chips, energy drinks but do not contain fast

food products. Respondents propose to levy tax on fast foods. It is their most important suggestion. Detailed data can be found in Figure 4.

Figure 4: Products which must be taxed in order of importance



Source: own research, 2011

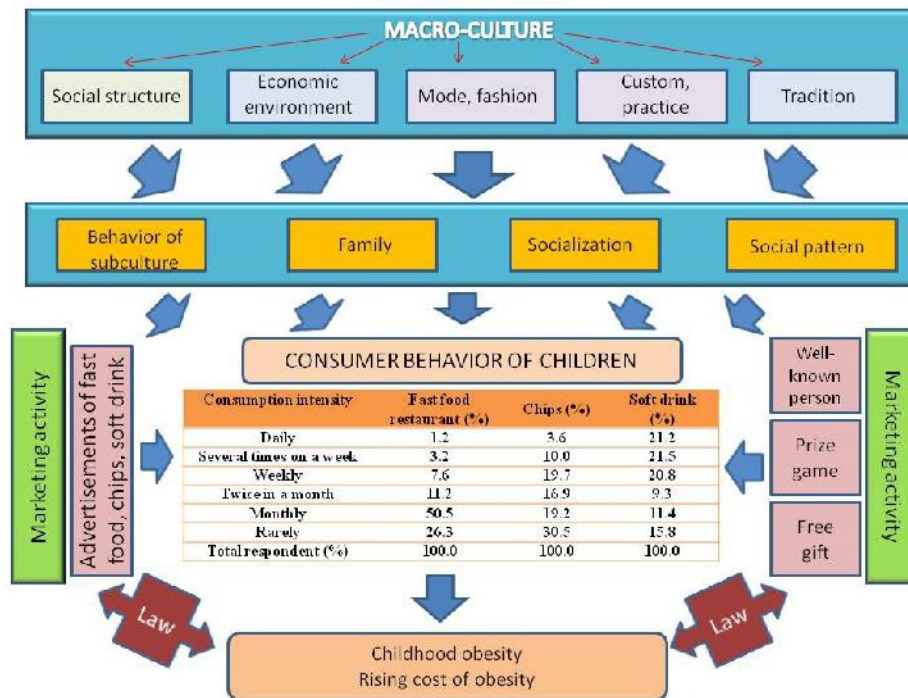
Products market as “light” have to be burden with the fat tax according the opinion of 44% of respondents.

Conclusion:

The idea of fat tax's introduction may be an obvious proposal. Its theoretical basis is indisputable. The introduction of fat tax is an opportunity, but does not solve the problem. The introduction of fat tax is not a panacea, but a chance. It can contribute to the keeping of health care expenses on an adequate level. Our elemental interest is the drastic reduction of obesity. The responsibility of marketing could be questionable from this point of view. Melissa Müller's study (2001) responds to the question unambiguously: The commercials make attractive the cartoon figures, well-known persons in mind of children. Influencing effect is undisputed. In mind of children the advertised product is very nice, better, faster, etc. than the non-advertised product. Children would like to buy a

product which can be found in television advertisement. They refer to the television. 20% of respondents recognize that they buy more unhealthy products if the price of these product are discounted. In our research we measured the influencing effect of different marketing activities: influencing effect of fast food and chips advertisements, influencing effect of cola advertisements, prize games, free gifts, well-known persons. The above mention factors are illustrated in our model which can be found in the Figure 5.

Figure 5: Influencing effect of marketing in case of foods with high level of fats, sugar and/or salt



Source: own research, 2010

There are some factors which influence the consumer behavior of youth. Some factors cannot be measured, e.g. tradition, social structure. Some factors can be measured, e.g. the efficiency of marketing activity, influencing effect of advertisements is about 30%, influencing effect of the well-know person is 20.8%, the influencing effect of prize games is 50.3% and the influencing effect of free gifts is 55.5%. It can be stated marketing activity has considerable effect in rising of childhood obesity and rising cost of obesity. The advertisements of foods with high level of fat, sugar and/or salt should not be banned, but restriction

is necessary according to opinion of 51% of respondents. This rate is 36% in case of free gifts. I can state that the “invisible hand” does not work in case of foods with high level of fat, sugar and/or salt, restrictions are necessary. But we have to acknowledge that the method of intervention is questionable. There are some initiation, e.g. New Jersey has passed a bill that will go into effect at the beginning of the 2007 school year. This bill includes the action of banning all soft drinks, candy, and any other item with sugar listed as the first ingredient and from schools altogether (Krisberg, 2005). Other initiation is the removal of any vending machines in Arkansas elementary schools (Costley, Leggett 2010). So, we can state that there are some possibilities to fight against obesity. The fat tax can be just one solution (with their own defect).

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