

THE INCOME SITUATION OF THE PRIVATE HOUSEHOLDS AND ITS IMPACT ON THE FOOD CONSUMPTION IN THE SLOVAK REPUBLIC

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Abstract

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Accession of the Slovak Republic to the EU in 2004 opened up the new opportunities not only in the formation of incomes but also in changes of consumer habits of the population in Slovakia. The basis for these changes were given before 1989, since when it has been possible to monitor realization of reforms. After 1989 have been observed the changes in the evolution of the household income and expenditure structure. The analysis confirms the significant differences and unbalanced right-inclined distribution of income. Households in the fourth income quartile had 2.8 times higher incomes than families in the first income quartile (Statistical Office of the Slovak Republic). Analyzed were the food groups that in terms of expenditure on food and food consumption took more than 6% share. The results confirm that income differentiation of households is also reflected in their different behavior on the food market. Most sensitive to changes in demand reacts income households with the lowest incomes.

In terms of living standard, when satisfying the living needs of population, the disposable monthly income is highly crucial. In meeting the basic needs of households play an important role expenditures on food, housing and energy. The Slovak households have high expenditures on food in comparison with other EU countries. In the structure of consumption expenditures the expenditure on food has decreased in recent years but still represents the highest share (in 2009 it was 21.95%) in comparison with expenditure on housing and energy (19.54% share in 2009).

Assessment of the standard of living of the population and its development is effected by several indicators. The key indicators that allow assessment of the standard of living and its development are the money income, consumption and expenditure for food, housing, culture, education and healthcare.

Data on the household incomes and the household expenditures for the stated needs point at the standard of living of the population as well as various social groups. Important is also the reciprocal comparison of the differences in expenditures for basic living needs of the household. During the transformation process expanded the variability types and groups of households. Downtrend is spotted in the average size of the households and growing pluralism of the various forms of coexistence.

income and expenditure of the households, elasticity of demand, bread and bakery products, meat and meat products

MATERIAL AND METHODS

The paper aims to identify changes and development in consumer behavior of the population on the food market. Measuring the

market size, identifying trends and the ability to predict the future development (Lesáková *et al.*, 2006) are the critical factors in identifying opportunities and risks of the market including the

food. On majority markets, there is unstable total demand or demand for individual foods and shows fluctuations, so reliable prediction of the future demand and consumption is a key factor affecting the knowledge. It is helpful in formulating the tasks of providing nutrition policy and food needs of the population in socio-economic conditions.

The paper laid the accent on analysis and determinants qualifying the consumer demand for food with accent on the analysis and determinants of cash income. The amount of income, its resources and structure are determined by social position of the population especially in the labor market. The transformation process and expression of the financial crisis led in creating relatively stable household groups and official statistics provides an overview of income and expenditure by net income quartiles of households.

The first income group (25% of the households) is on the lowest level of income, the pensions and social funds are the overwhelming source of revenue. Their expenditure structure is typical for poor households, which must reduce their consumption. Statistical Office of the Slovak Republic provides the input empirical data on net incomes and expenditures of the households for food and non-alcoholic beverages in quartile segmentation by net money income per capita for the years 1998–2009.

There had been used the methods of descriptive statistics and trends of development using the base and chain indexes and the average growth factor. Analysis of food expenditure and household consumption, which resulted from their inclusion in the income quartile, was made by using the regression and correlation analysis. We have emanated from the regression model, and following premise:

$$RV_{kj} = f(RPK) + ekj, \quad (1)$$

where:

RV_{kj} real expenditure of households in the k – income quartile ($k = 1, 2, 3, 4$),

for the j ...food commodity, model is determined by the relation:

$$RV_{kj} = Q_{kj} \times P_{kj},$$

RPKthe real money incomes of households in k – income quartile

P_{kj}the real price of the j – food commodity in the k – income quartile

Q_{kj}purchased quantity of j – food commodity in the k – income quartile

ekjrandom variable.

In addressing the relation (1) was used the log-hyperbolic function

$$RV_{kj} = \exp \left(a + b \frac{1}{RP_k} \right), \quad a > 0, b < 0$$

that appropriately described the process according to real food expenditure and its dependent on real income, which has the asymptote characterized the saturation of demand and describes trends in spending, or consumption and the large fluctuations in revenue (Sznajder, Adamczyk, 2003). In addressing the demand function (1) after its transformation to a linear form, we had used the method of least squares.

The suitability of different models depends on the course description of food expenditures, food consumption and the real income had been considered by using the coefficient of determination R^2 and parameters of regression equations using the Student's t – distribution.

RESULTS AND DISCUSSION

Development of cash income and consumption expenditures

Available funds and resources of the households are sensitive factors to the ongoing processes in the social and economic spheres of the society. The amount of the money income of the households, their sources and structure are primarily determined by their position in the labour market.

The transformation process in Slovakia has contributed to the creation of relatively stable household groups. The empirical analysis (Pacáková *et al.*, 2005) show that net annual money income of the Slovak households reported non-symmetrical distribution with characteristic prolonged right end. Predominant are the households with low-income. Gradually was increasing the differentiation, and even if nominal earnings rose in all households, part of the households (families with more children, pensioners) are still at the level of low income and even destitution. The first quarter of household incomes located between the bottom quartile and median value, disposed with an average annual real income of 1649.68 € per household member (Tab. I).

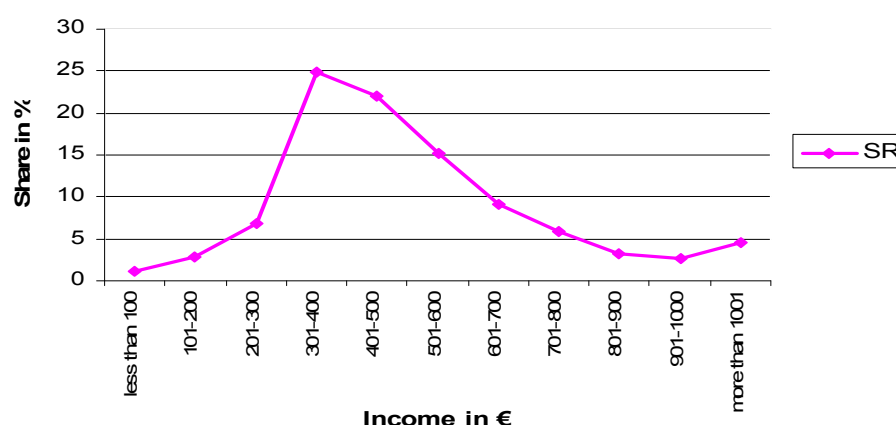
Table I is based on the data from Statistical Office of the Slovak Republic and own calculations. Household income in the third quartile was in real value 2948.23 € and 1.8 times higher than the household income in the first quartile. In the fourth quartile it was as many as 2.8 times higher than the mentioned household income in the first quartile. Growth coefficient (k') of real income since 1998 has had an increasing trend and has ranged in diameter from 7.3% in the first income quartile ($k' = 1.073$) up to 9.7% in the fourth – the highest income quartile. Uneven distribution of incomes has been deepened since 1989. Greater differentiation and acceleration of growth of real incomes can be observed since 2003.

In 2003 the top income quartile of real household incomes increased on average by 11.7% ($k' = 1.1169$) and the first income quartile only by 10.5%. Adaptation mechanisms and the ongoing

I: Money incomes and expenditures of private households in quartile segmentation by net money income per person in 1998–2009

Coefficient		1st quartile	2nd quartile	3rd quartile	4th quartile
Real Money Incomes	Average in €	1649.68	2366.92	2948.23	4577.69
	Index 2009/1998	2.165	2.310	2.323	2.579
	Growth coefficient	1.073	1.079	1.079	1.089
Real Consumer Expenditures	Average in €	1688.48	2316.01	1688.48	4197.18
	Index 2009/1998	2.095	2.098	2.095	2.118
	Growth coefficient	1.069	1.069	1.069	1.071
Real Expenditures on Food and Soft Drinks	Average in €	496.177	640.254	729.478	830.119
	Index 2009/1998	1.631	1.699	1.532	1.557
	Growth coefficient	1.045	1.049	1.039	1.041

Source: Statistical Office of the Slovak Republic, own calculations



1: Monthly disposable income per person in Euro in the Slovak Republic

Source: EU SILC 2009

development showed the non-standard features and on the scale of income bands the part of households was situated in the low-income zones with a sharp drop to the average values and slower growth of the households (Fig. 1).

Figure 1 is based on the data from EU SILC 2009–The Statistics on Income and Living Conditions of Households in the Slovak Republic, Statistical Office of the Slovak Republic and own calculations.

Average annual equivalent disposable income (EU SILC 2009) of the households in Slovakia was 6 629 €. In the interval of disposable income per person and month from 101 € to 400 € was found in 50.0% four-person households. The Gini coefficient that measures the inequality of income distribution (EU SILC 2009) was 24.8. Threshold for determining the real poverty of the EU Member States is the income level of one equivalent household member in amount of 60.0% of median equivalent income (Kubicová, 2007). The results of the harmonized EU SILC survey showed that the risk of poverty rate after social transfers in the family with two children in 2009 in Slovakia was 9.9% and in families with three or more dependent children it was 27.9%. Uneven development of pensions was reflected in consumption expenditures of the population. Total consumption expenditures by households in the fourth income quartile increased on average by 7.06% ($k' = 1.0706$) per year, and the first quartile of consumption expenditure growth was 6.9%.

Income of the households in the first quartile were insufficient to cover necessary consumption expenditures, so that part of the expenditures could be covered only through savings, loans and also undocumented (black) income. Real food expenditures were on the other hand, counterfactual with a downward trend. Unlike the total consumption expenditure of the households with the lowest incomes which increased on average by 4.54% per year ($k' = 1.045$), while in the households located in the higher income quartiles of the median food expenditures increased on average by 4.1% ($k' = 1.041$).

In the absolute terms, household consumption expenditures in the fourth income quartile were only two and a half times higher than actual expenditures in the first income quartile. Expenditures for food and soft drinks were only 1.67 times higher than in the lowest income households. This confirms knowledge of Engel, that the costs and quantitative demand for food grows slower than income population grows.

Food expenditures in the pattern of consumption expenditure were reduced in all income groups of households. The highest food expenditures for beverages and catering (32.51%) reported households in the first income quartile.

The most significant decline in food expenditure (Tab. II) was in the highest income quartile of the households by 6.84 percentile points, in the third

II: Structure of the consumption expenditures of households in the Slovak Republic per person per year in %

Households	Consumption Expenditures (=100)	2000	2009
1st quartile	Food, beverages and catering	39.66	32.51
	Non-food goods	31.76	30.49
	Services	24.16	27.96
	Other net expenditures	4.42	9.04
2nd quartile	Food, beverages and catering	38.68	31.72
	Non-food goods	29.31	31.92
	Services	26.43	27.08
	Other net expenditures	5.58	9.28
3rd quartile	Food, beverages and catering	37.34	29.94
	Non-food goods	29.65	29.66
	Services	25.69	30.68
	Other net expenditures	7.31	9.73
4th quartile	Food, beverages and catering	31.81	24.97
	Non-food goods	29.97	28.17
	Services	29.08	31.26
	Other net expenditures	9.13	15.60

Source: Statistical Office of the Slovak Republic, own calculations

income quartile by 7.4 percentile points where the food expenditure occupied 29.94% share in the structure of consumption expenditures. After 2001, development has been marked by projecting the administrative arrangements within the administered prices, and the households has been forced to re-distribute consumption expenditures in relation to the disposable income. As a result of a fall of interest rates has declined also the revenues from income and property. Accelerated has been the convergence of payment structures to the structures of the EU Member States, especially in housing, transportation, food services, although when compared to the EU-15 countries, food expenditures of Slovak households are still high (Horská *et al.*, 2011).

In the structure of consumption expenditures was possible to observe the consequences of different dynamics of nominal income growth and cost of living. Significantly had increased the spending on services and other expenses in the third and especially fourth income quartile. Expenditure on clothing and footwear in 2008 were three times higher than in households with the lowest incomes. In the fourth income quartile the households spent four to five times more funds for transport, culture, recreation, furniture and home furnishings than in the first quartile.

The overall increase in spending on services (Tab. II) were attributable to the growth levels of rent and municipal services. In 2009 compared with 2000 expenditures of this kind had increased in all households. The highest increase was in expenditures for services by 2.2 percentile points and in expenditures for services and other expenses by 6.5 percentile points could afford particular household income in the fourth quartile as an indication of the possibility of higher claims and to ensure their living standards compared with families falling into the first, or second income quartile.

Table II. is based on the data from Statistical Office of the Slovak Republic and own calculations.

Income elasticity of food expenditure and its expression in the particular household income groups

The size of consumer spending affects many factors such as tradition, family age structure, socio-economic situation of individual households and their economic environment. The results confirm that the poorer the household was, the higher were its expenditures to meet the basic living needs such as nutrition, housing, healing and lower discretionary spendings for culture, recreation and education (Kubicová, 2007). Changes in the level of income create a different room for maneuver for individual households (Rovný *et al.*, 2008). The problem is still in a high proportion of expenditure on food, beverages and catering (Tab. II). This causes the pension restrictions and the sensitive consumer behavior responding to the changes in prices of goods and services. A significant part of the households, especially in the first and in the second income quartile with notable changes in prices, reduced consumption and expenditure on individual foods and in the physical units. Changes in food consumption and food expenditure pattern had been analyzed from the perspective of the individual aggregate food groups and attainment of disposable money income of individual households. We were focused primarily on food groups of the bread and bakery products as well as the meat and meat products, which are indispensable and irreplaceable in ensuring the basic nutritional needs of household members.

In the Table III can be observed that during the eleven seasons there had been changes in the structure of household consumption as follows: the growth in expenditure for bread and bakery products and the decline in expenditure for meat and meat products.

Money spent for each aggregated food group and income elasticity of expenditure beyond saturation across household income groups have been examined by using the regression analysis. From the number of possible regression functions used in the investigation of economic phenomena we have chosen as an appropriate the log-hyperbolic function allowing to analyze the income elasticity of demand and to estimate the limit of saturation of demand.

III: *The share of money expenditures for the aggregated food groups of the total expenditure for food and soft drinks per person per year in %*

Food Groups	1998	2000	2009
Bread and Bakery Products	15.7	16.5	18.8
Meat and Meat Products	26.4	25.8	24.1

Source: Statistical Office of the Slovak Republic, own calculations

Table III is based on the data from Statistical Office of the Slovak Republic and own calculations.

On the basis of the analysis could be found that demand for bread and bakery products is income-inelastic, bread and bakery products belong to the group of the basic goods. Indicators of the income

elasticity within each income quartile are relatively balanced (Tab. IV). The highest value of the income elasticity of the household expenditure was reported in the second income quartile ($E_i = 0.604$). To increase the money income by 1%, the households responded by increasing of expenditures for bread and bakery products on average by 0.6% in the second quartile. Preferences and demand for bakery products that shift to higher household income groups were only slightly reduced. Consumption of bread and bakery products due to household income reported low variability. Bakery products are the basic food of Slovak households. In 2009, consumption of bread and bakery products ranged from 89.2 kg in the first income quartile to 99.59 kg in the fourth income quartile. Maximal saturation of consumption and expenditure for bread and bakery products is derived from the earnings growth from 174.3 € per person per year in the first income quartile to 217.6 € per person per year in the wealthy families. Since 1998 the expenditures for bread and bakery production have gradually increased on average by 3.1 percentile points on the level of 18.8% in the pattern of the consumption expenditures.

Table IV is based on the results of own calculations.

IV: *The course of dependence, saturation, and income elasticity of expenditure for bread and bakery products from the real income of households by income*

Income Groups	Parameters of Functions	Income Elasticity E_i	Saturation Limit	R^2
1st quartile	$\ln RV_1 = 5.161 - 896.34 \frac{1}{RP_1}$	0.569	174.36	0.943**
2nd quartile	$\ln RV_2 = 5.343 - 1429.62 \frac{1}{RP_2}$	0.604	209.48	0.969**
3rd quartile	$\ln RV_3 = 5.344 - 1568.46 \frac{1}{RP_3}$	0.532	209.41	0.949**
4th quartile	$\ln RV_4 = 5.383 - 2288.84 \frac{1}{RP_4}$	0.500	217.64	0.964**

** Statistically proven parameter, significance level $\alpha = 0.01$

Source: Statistical Office of the Slovak Republic, own calculations

V: *The course of dependence, saturation, and income elasticity of expenditures for meat and meat products from the real income of households by income quartiles*

Income Groups	Parameters of Functions	Income Elasticity E_i	Saturation Limit	R^2
1st quartile	$\ln RV_1 = 5.175 - 1196.02 \frac{1}{RP_1}$	0.725	249.03	0.913**
2nd quartile	$\ln RV_2 = 5.737 - 1510.09 \frac{1}{RP_2}$	0.638	310.29	0.947**
3rd quartile	$\ln RV_3 = 6.172 - 2037.23 \frac{1}{RP_3}$	0.691	479.02	0.627*
4th quartile	$\ln RV_4 = 5.740 - 1702.90 \frac{1}{RP_4}$	0.372	311.22	0.938**

** Statistically proven parameter, significance level $\alpha = 0.01$

* Statistically proven parameter, significance level $\alpha = 0.05$

Source: Statistical Office of the Slovak Republic, own calculations

Expenditures for meat and meat products occupy the largest share of spending in the food basket of the Slovak households (Kleinová, Kretter, 2011). Their share in the pattern of food expenditure has been reduced, and in 2009 it presented 24.1% share of total food expenditures. The lowest consumption of meat and meat products was reported in the lowest income quartile (43.04 kg per capita in 2009). In the higher income groups, the consumption gradually increased and in the fourth income quartile in 2009 it was 60.49 kg per person. Consumer demand for meat products was marked by considerable variability of material consumption as well as cash expenditures across income groups. Households with the lowest incomes had the highest expenditure elasticity ($E_i = 0.725$).

Comparable and consistent results indicate (Bielik, Šajbidorová, 2009) and in the conditions of Polish households (Gulbicka, Kwasek, 2006). Households have unmet nutritional needs due to their low purchasing power. The increase of the money income by 1% may be reflected on average by 0.725% increase in expenditure for meat and meat

products. By shifting into higher household income quartiles, the preferences and demand for meat and meat products and their income elasticity had been reduced (Tab.V).

Table V is based on the results of own calculations. Households with the highest incomes had better saturated dietary needs and 1% increase in money income could be reflected on average by 0.372% growth in expenditures for meat and meat products (Tab.V), while in the households with the lower-income only with 0.638% up to 0.725% growth.

Our results correspond with published findings (Mura, 2010).

Level of satisfaction of nutritional needs is increasing with the growth of income, which was also reflected in declining levels of income elasticity of demand with the highest household real incomes. Preferences for food decrease in proportion to the degree of transition from the households with lower income to the higher income groups, because these families have better opportunities to ensure their nutritional needs (Nagyová, 2009).

SUMMARY

In the advanced economies, the human needs had been shifted to a higher level of needs within Maslow's Needs Triangle, where the basic level are the physiological needs. Consumers expect the food to be wholesome to contribute to the protection of their health and also the consumers by this way demonstrate their image and life attitude. Pension elasticity of these attributes is changed simultaneously with the income growth. The consumer demand shifts toward more valuable, better processed and prepared foods and intermediate products. During the transformation period in Slovakia there came to differences in income and wealth, which was reflected in total consumption and expenditures for food. The real and nominal income of the households were in the fourth quartile 2.8 times higher than the household income in the first quartile. A high proportion of the household food expenditures limits the households in deciding about the amount and structure of the consumed food. The different income levels and price developments are strongly reflected in the changes in the structure of consumption expenditures. In the evolution of the consumer demand and structure of expenditures over the eleven year period could be observed the following trends:

- declining but still high share of expenses for food, beverages and catering, but these were reduced on average by 4.9–7.5 percentile points by transiting to the higher income quartiles,
- significantly were increased the costs for services and other net expenses especially in the households of the income groups located on the right side of the median income distribution,
- increasing of expenditures for bread and bakery products,
- decreasing of expenditures for meat and meat products,
- there had been the negative high prices of the consumer goods and services in comparison with the level and growth of incomes in the meaningful part of the Slovak households. Limit for the risk of poverty in the households with two children has risen since 2005 from 4 737.4 € to 6 183.3 € in 2009 (EU SILC 2009, SO SR).

After social transfers below the poverty line was 9.9% of households with two children and 27.9% of households with three or more dependent children.

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