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CHANGES IN SLOVAK HOUSEHOLDS´ ECONOMY

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Abstract
The article deals with analysis of changes in the economy of Slovak households in the years 2004 – 2012. Household budget survey data of individual households are used for the analysis. The main tendencies of income and obligatory and facultative expenditure items are described in the structure. The data are recalculated into the basis of 2004 using monthly consumer price indices. The analysis enables to identify the effects of the introduction of Euro on income-expenditure development of Slovak households. Households´ income and expenditure differences among Slovak regions (using NUTS 3 classification) are revealed using statistical methods. The disparities in the concrete income and expenditure items are detected among regions and their significance is confirmed.

Key words: *households, Income, expenditure, Household Budget Survey, Slovak regions.*

1. Introduction

In both Slovakia and in Europe, the end of the 20th and the beginning of 21st century is marked by changes in political, economic, social and cultural processes, which have been reflected in the life of individuals, households, families and in all the economy. Households as economic units have responded to them very sensitively. Their income and consumption levels have been affected by the social and economic changes (Beinhocker, Davis, Mendoca, 2009), while the consumption is strongly influenced by income (Uramová, Lacová, Hronec, 2010).

Income and expenditures of population can be described using the national accounts system or households budget survey. The first one includes the data of the whole population. It has high information value about the general income and population consumption level and structure in the connection with the formation and use of a domestic product in the economy. The second technique monitors the income and expenditures on the basis of a representative sample of households and enables to explore the income and expenditure levels in various social population groups categorized by the number of children, household members, household type, etc.

Statistics on Income and Living Conditions (EU SILC) was implemented in Slovakia in 2005 in line with the harmonization of European Surveying. It is the survey aimed at obtaining information on income distribution, level and composition of poverty and on social exclusion. The survey provides data on income (from labour, social security and others), information on opinion of households on their financial position, and especially information on indicators of material deprivation for different types of households, but it does not cover the expenditures information (Whelan, Maitre, 2013).

In our analysis, we used the data from the database of Household Budget Survey in Slovakia in years 2004 – 2012 (methodology of sampling was changed in 2004), monthly

indices of consumer prices for recalculation of the data into the constant level and statistical program packets R and SPSS 19. The database of Household Budget Survey includes data of individual households and it comprises 43 686 records. The survey is conducted by Statistical Office of Slovak Republic (Income, Expenditure and Consumption of Private Households, pp. 155-160)

2. Income and Expenditures in the Slovak Households

Households record all the income and expenditure items in the Household Diary, while the household income consists of the financial income (income from employment, social income, income from private business and property income) and the natural income.

Household expenditure is divided into the consumption expenditure and the other expenditure. The structure of consumption expenditure is given by the Classification of Individual Consumption of Purpose (COICOP) for household budget needs. According to the classification, these expenditures are divided into twelve expenditure groups (e1 – e12).

Table 1. Average yearly income and expenditure in Slovak households and the expenditure structure.

Indicator \ year	2004	2005	2006	2007	2008	2009	2010	2011	2012
Net money income in total (EUR) - CPP	2 899	3 014	3 432	3 845	4 227	4 207	4 187	4 341	4 463
Net money expenditure in total (EUR) - CPV	2 820	2 935	3 367	3 649	3 896	3 679	3 693	3 849	3 950
of which per cent Consumption expenditure (SV)	92,0	92,1	90,9	90,4	89,3	88,6	89,2	89,4	89,8
of which: Food and non-alcoholic beverages (e1)	24,7	24,2	22,5	22,1	22	21,5	22,1	21,8	22,3
Alcoholic beverages, tobacco and narcotics (e2)	3	2,8	2,6	2,7	2,5	2,7	3,0	2,9	2,9
Clothing and footwear (e3)	5,4	5,5	5,3	5,6	5,9	5,4	5,3	5,3	5,0
Housing, water, electricity, gas and other fuels (e4)	22,4	21	21,7	19,8	19,5	20	20,4	20,2	20,4
Furnishings, household equipment and routine maintenance of the house (e5)	4,2	4,1	4,2	4,8	4,8	4,4	4	3,8	3,7
Health (e6)	2,6	2,7	2,6	2,4	2,7	2,7	3	2,9	3,1
Transport (e7)	7	8,2	7,9	8,6	7,8	7,7	7,2	8	8,1
Communications (e8)	4,1	4,2	4,8	4,9	5	5,5	5,3	5,2	5,2
Recreation and culture (e9)	6,2	5,9	6,4	6,6	7,1	6,7	7,2	7	6,9
Education (e10)	0,6	0,8	0,7	0,7	0,5	0,5	0,4	0,4	0,4
Restaurants and hotels (e11)	4,1	4,3	4,6	4,7	5,1	5,1	4,9	5,4	5,4
Miscellaneous goods and services (e12)	7,8	8,3	7,5	7,3	6,5	6,5	6,3	6,5	6,3
Other net expenditure	8	7,9	9,1	9,6	10,7	11,4	10,8	10,6	10,2

Source: Statistical Yearbook of the Slovak Republic 2009, 2012 and Income, Expenditures and Consumption of Private Households in 2012

Expenditure group e1 and e4 together can be denoted as obligatory expenditure including only the indispensable expenses for household, all other expenditure groups are facultative or voluntary expenditure.

The expenditure group "other expenditure" covers payments of non-consumable nature, income and property tax, compulsory personal insurance, monetary gifts outside the household, loan repayments, buying stocks and loans, large expenses to repair a flat or house (more than 1,000 EUR).

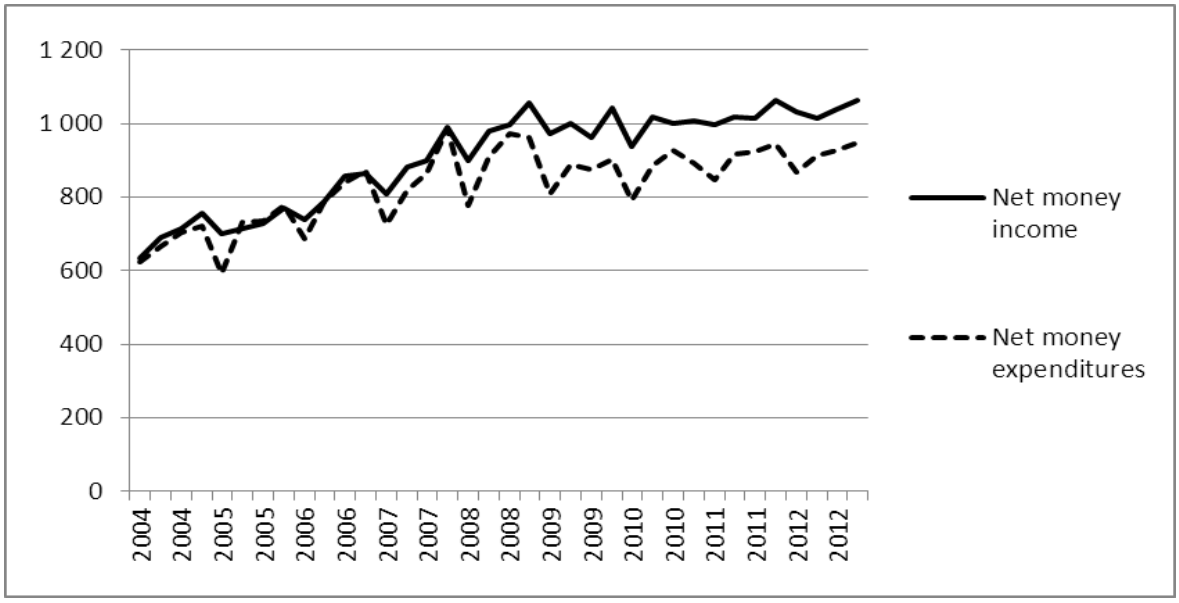

Figure 1 Net money income and expenditure in Slovak households, quarterly averages 2004 - 2012, current prices.
Source: Household Budget Survey database

Real financial situation of Slovak households in 2004 – 2012 could be described by two different trends in the two following periods. In 2004 – 2007 income and expenditure rose and expenditure copied the income level very closely (Figure 1, Table 1). In 2008, the gap between income and expenditure in households widened and this gap persisted until the end of surveyed period. It opened the space for households´ savings, while for their analysis are used both microeconomic and macroeconomic approaches (Niculescu-Aron, 2013). Increasing savings level could be the response of households to the mortgage crisis which affected the whole Europe or to the expectations connected with Slovakia joining the Eurozone. They represent the cautious approach of households towards consumption at the time of crisis and their deferred consumption to the future. Effects of crisis were present stronger and longer in the economies of the poorest countries in European Union (Mihaescu, Niculescu-Aron, 2012).

There were also changes in the expenditure structure of Slovak households' economy. The consumption decreased and the group of "other expenditure" demonstrated an increasing trend. Obligatory expenditure (food and housing) decreased from 47.1 % of consumption expenditure in 2004 to 42.7 % in 2012. As for the facultative expenditure groups, the highest

increase was recorded for the expenditure groups e11 - restaurants and hotels, e8 - communication and e9 – recreation and culture.

The trends mentioned above were influenced by changes in the real amount of income and expenditure (total and in the groups), but - which is very important - also by the changes in price levels.

3. Price changes in 2004 - 2012

For the whole surveyed period, the prices in general increased nearly by 30 %. The highest growth was recorded in education (136 %), healthcare (68 %) and housing (63.9 %). The prices of all other expenditure groups rose from 3.1 % (clothing and footwear) up to 35.3 % (restaurants and hotels) while prices of furnishings and household equipment fell by 11.8 %.

The prices did not develop steadily during the whole period. Whereas in 2004 – 2008 the total increase was 18.3 % (5 years), in 2009 – 2010 it was only 1.8 % and in 2011 – 2012 prices increased by 7.8 %. The growing trend of consumer price indices in Slovakia was stopped by the introduction of Euro in 2009. The development of prices in the respective period can be seen in the Figure 2. Similar price situation is described in Latvia economy (Vilcina, Andersons, 2012).

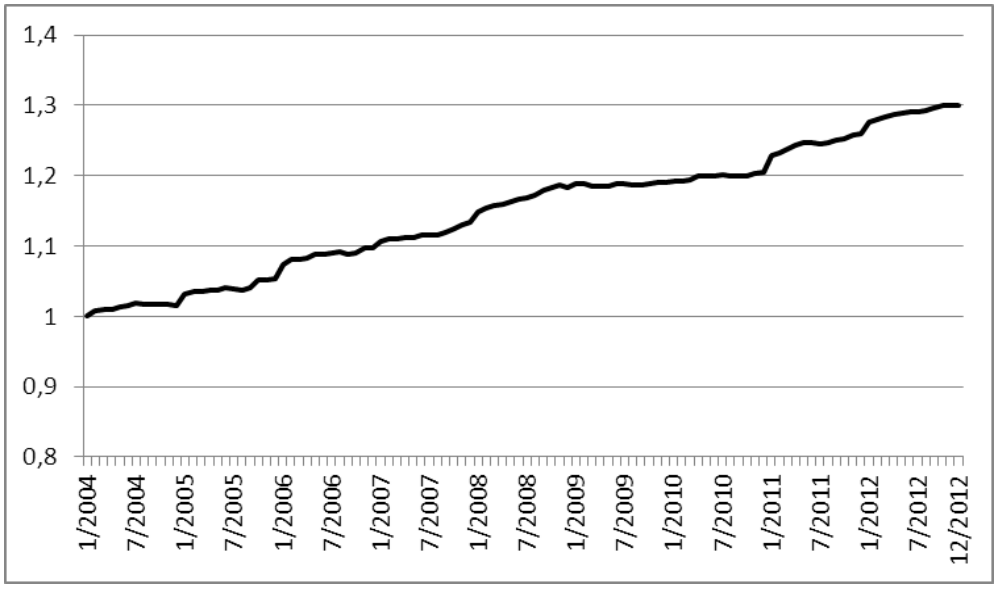

Figure 2 Price trend – monthly consumer price indices 2004 – 2012.
Source: Own recalculation on the basis of indices of consumer prices in comparison with the previous month.

The monthly consumer price indices will be used in data preparation for modeling the trend of households' income and expenditure in 2004 - 2012.

4. Modeling the trend of income and expenditure

Before modeling income and expenditure amount trend, it is appropriate to eliminate the price effect on net income and expenditure. We recalculated monthly average household income and expenditure to constant prices corresponding with the price basis of January 2004 using monthly consumer price indices.

Distinct turn in the development of income-expenditure situation of households in Slovakia in 2008 is indicated by broken stick regression. Monthly data on income and expenditure were divided into two groups – data observed in period 2004 – 2008 (t = 1, 2,…, 60) and in the period 2009 – 2012 (t = 61, 62, …, 108). January 2009 was used as a breaking point due to introduction of Euro in Slovakia.

After recalculation of income and expenditure items to constant prices we can see that they are increasing in 2004 – 2008 and are steady or slowly decreasing in the rest of the surveyed period. This situation is demonstrated by the parameters of broken stick regression model (Table 2, Figure 3). Broken-stick regression (also known as piecewise regression or segmented regression) is a method in regression analysis in which the independent variable is partitioned into intervals and a separate line segment is fit to each interval. The least squares method is applied separately to each segment.

Table 2. The model of net money income (CPP) development with respect to break-point and constant prices.

period	Model parameters (std. deviations) (p-values)	Adjusted R^2
2004 - 2012	$CPP = 852.245 - 3.394 \cdot B_1(t) - 1.069 \cdot B_2(t)$ (8.420) (0.269) (0.344) (0) (0) (0,0024) Where $B_1 = \begin{cases} 60 - t & \text{when } t \le 60 \\ 0 & \text{otherwise,} \end{cases}$ $B_2 = \begin{cases} t - 60 & \text{when } t > 60 \\ 0 & \text{otherwise.} \end{cases}$	0,644

Source: based on R output

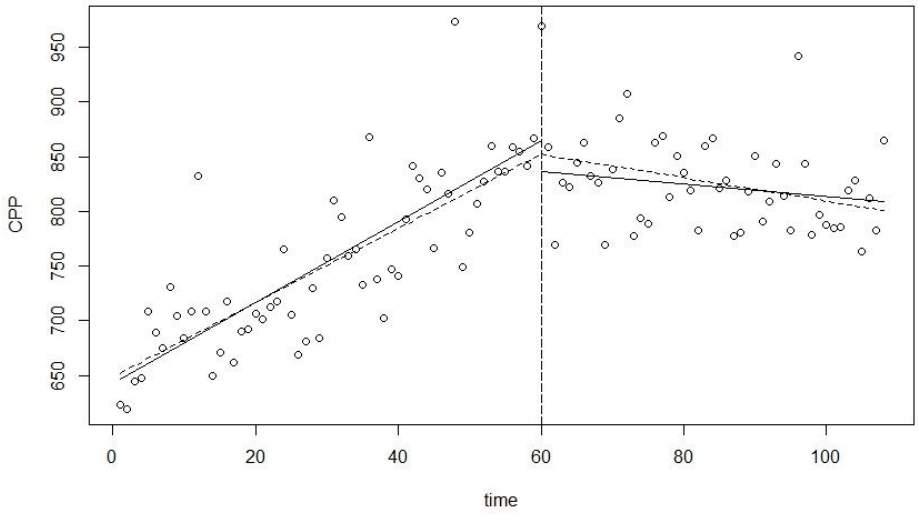

Figure 3 Development of monthly net money income in 2004 - 2012, two linear functions and broken stick regression model.
Source: R output

In the first part of the period, Slovak households recorded an increase in net money income of 3.4 Euro monthly. On the contrary, in the years 2009 – 2012 net income was decreasing by 1.1 Euro monthly, which indicates slow decreasing of real income in the Slovak households (without price influence).

Situation of households' net money expenditure (CPV) in constant prices is similar to the one of CPP (Table 3, Figure 4), although its increase in years 2004 – 2008 is slighter. However, decreasing trend of expenditure in the second period is stronger than that of net money household income, which enables households to create savings.

Table 3. The model of net money expenditure (CPV) development with respect to break-point and constant prices.

period	Model parameters (std. deviations) (p-values)	Adjusted R^2
2004 - 2012	CPV = 774.636 – 2.0542 $B_1(t)$ – 1.582 $B_2(t)$ (12.175) (0.389) (0.497) (0) (0) (0,0019)	0,195

Source: based on R output

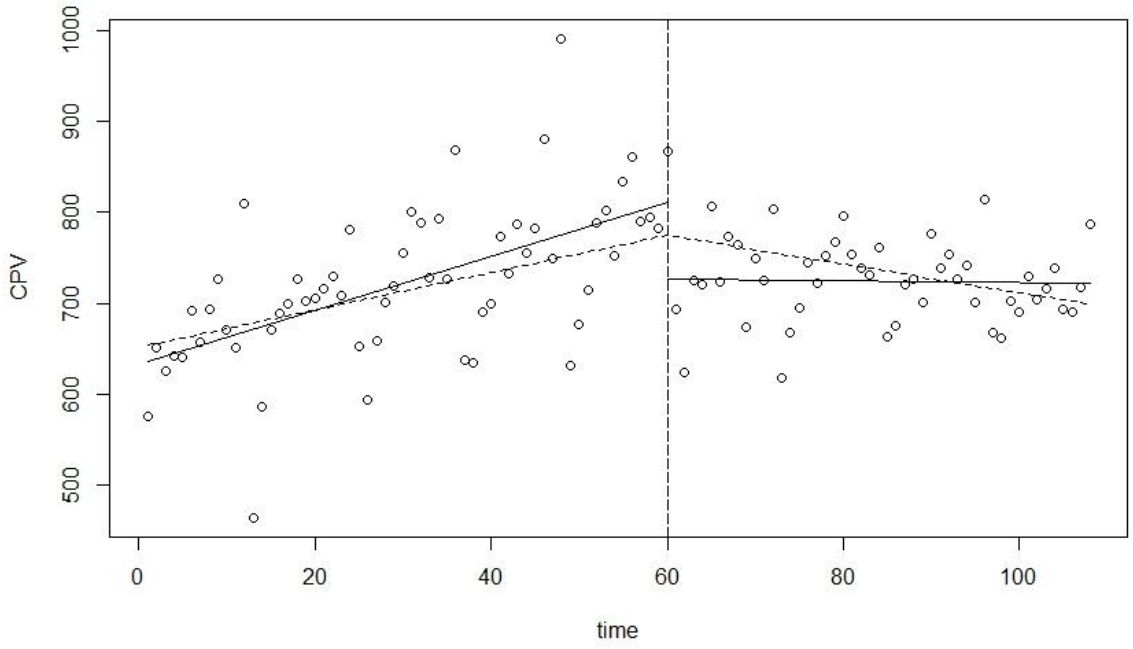

Figure 4 Development of monthly net money expenditure in 2004 - 2012, two linear functions and broken stick regression model.
Source: R output

5. Financial situation in households in Slovak regions

Income situation in Slovak households as a whole is copied by the income situations in the regions with the exception of Bratislava region (BA). The best income situation in the respective period was in Bratislava region with the highest GDP per capita, the highest

standard of living, the widest job offer and the lowest unemployment rate. Income situation in non-Bratislava regions was quite similar, but the worst situation was in Banská Bystrica region (BB). In 2012 the income level difference between Banská Bystrica region and Nitra region was statistically insignificant. However, all the regions had comparable income development, increasing in 2004 - 2008 and stagnating or slow decreasing in 2009 – 2012 (Figure 5).

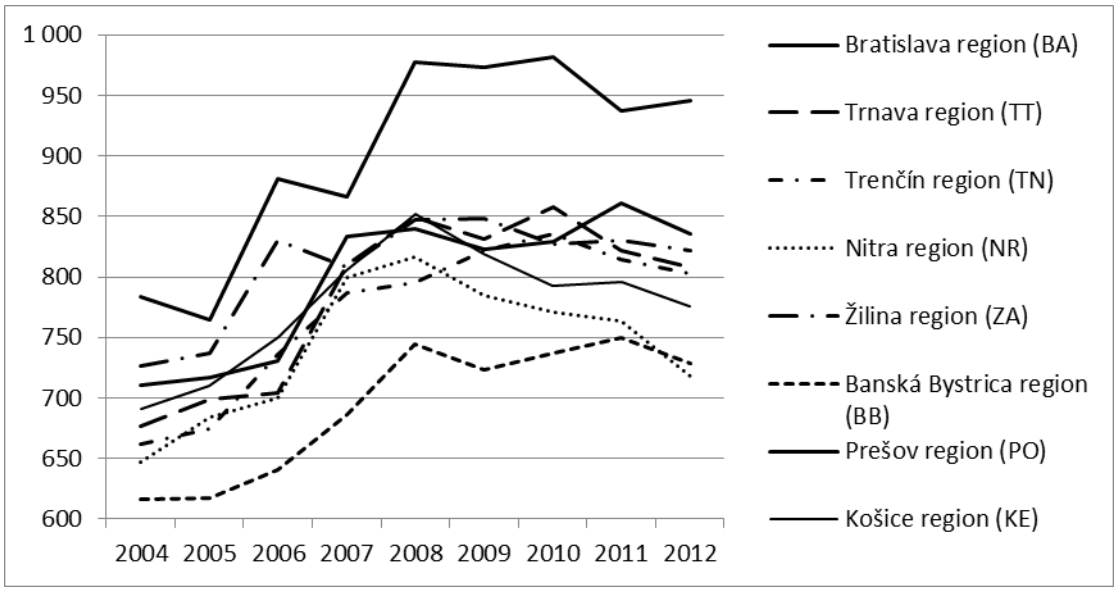

Figure 5 Net money income of households in Slovak regions in constant prices, monthly averages in years 2004 – 2012
Source: Household Budget Survey database

Expenditure situation in regions in 2012 was compared using Mann-Whitney test and 5 % significance level. Net money expenditure in Banská Bystrica and Nitra region was statistically significantly lower than in all other regions (expenditure copied the lower income level). Obligatory expenditure (food and housing) was the highest in Bratislava region and the lowest in both Banská Bystrica and Nitra region. It was interesting the same expenditure level for health and communication in all regions. The same and the highest recreation and culture expenditure is in Bratislava and Žilina region. In Bratislava region was the highest expenditure for the education (Bratislava is the capital city with the highest concentration of schools of all types) and for other net expenditure (the greatest burden of households by loan repayments, taxes, insurance payments and other payments of non-consumable nature).

For the detection of significant differences between Bratislava region (reference category) and the rest of the regions in the end of the surveyed period – in 2012 we used multinomial logistic regression. It offers a lot of information (Table 4) so we will interpret the most typical and statistically significant parts of it. Compared to the reference region of Bratislava, in all other regions there is lower net household money income and higher income from employment and social income. On the other hand, household expenditure for housing in all regions is lower than in Bratislava while there are not significant differences in transport in every non-Bratislava region compared with Bratislava region.

Table 4. Coefficients and p-values from multinomial logistic regression

indicator	coefficients							p-values						
region	TT	TN	NR	ZA	BB	PO	KE	TT	TN	NR	ZA	BB	PO	KE
Intercept	,047	-,027	,649	-,486	,512	-,228	,056	,788	,881	,000	,008	,005	,209	,755
CPP	-,002	-,003	-,001	-,001	-,002	-,001	-,001	,001	,000	,020	,112	,001	,065	,128
income from employment	,003	,004	,003	,002	,003	,002	,003	,005	,000	,000	,004	,011	,038	,001
income from bussiness	,002	,003	,001	,001	,002	,001	,000	,001	,000	,223	,127	,002	,012	,407
social income	,003	,004	,001	,001	,003	,001	,001	,000	,000	,042	,020	,000	,000	,004
e1	,001	-,001	-,001	,004	-,002	,000	,000	,479	,470	,435	,000	,012	,973	,948
e2	,002	-,001	,003	,005	,003	-,001	-,002	,247	,495	,193	,008	,104	,596	,337
e3	,000	,002	,002	,002	-,002	,002	,002	,850	,101	,076	,031	,176	,116	,080
e4	-,001	-,002	-,001	-,002	-,002	-,002	-,002	,045	,004	,017	,001	,001	,000	,007
e5	,001	,002	,001	,002	,002	,002	,001	,153	,007	,355	,047	,063	,022	,189
e6	-,002	-,003	-,001	-,002	-,002	-,001	-,003	,043	,033	,160	,060	,092	,313	,016
e7	,000	,000	,000	,000	,000	-,002	,000	,926	,553	,484	,642	,560	,062	,786
e8	-,007	-,003	-,002	-,006	-,003	,002	-,003	,003	,196	,456	,007	,171	,433	,149
e9	-,001	,000	-,001	-,001	-,002	-,001	-,001	,087	,396	,032	,015	,002	,004	,028
e10	-,007	-,017	,002	,002	-,001	-,010	,001	,084	,004	,539	,411	,760	,025	,714
e11	-,002	-,003	-,006	,005	,001	,006	-,003	,107	,042	,000	,000	,429	,000	,041
e12	,007	,008	,005	,002	,009	,006	,005	,000	,000	,004	,135	,000	,000	,001
other expenditure	-,001	-,001	,000	-,001	-,001	-,002	,000	,086	,002	,437	,150	,062	,001	,490

Source: SPSS output

6. Conclusion

In the period of 2004 – 2008 in Slovakia, both money income and expenditure increased, whereas consumption expenditure decreased and payments of non-consumable nature increased gradually. In 2009, however, this trend discontinued and there appeared space for households' savings. Almost stable levels of nominal income and consumption ended in 2011 when they started to increase again. By removing the price effect to income and expenditure household items, we obtained a more detailed view of real household income and expenditure. Recalculated data revealed that stagnation of financial situation in the Slovak households in 2008 changed into slow decrease of real income and expenditure level up to 2012. Broken stick regression was used for modeling the income-expenditure situation, which allowed the interpretation of coefficients, i.e. average monthly changes of both variables.

Situation in the regions was quite different from the Bratislava region. Whereas non-Bratislava regions have worse net money income situation with higher social income compared to Bratislava, BA region declares the highest housing expenditure and payments of non-consumable nature.

Income-expenditure situation in Slovak households had the similar development with some special differences in regions.

Acknowledgements

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