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ANALYSIS OF THE AGRICULTURAL LAND MARKET TRANSACTIONS IN SELECTED REGIONS OF SLOVAKIA IN THE YEARS 2007–2016

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Despite the fact that the agricultural land market in Slovakia has developed in recent years, the overwhelming part of agricultural land in Slovakia is utilized in the form of rent. Only a small part is managed by the landowners themselves. It is therefore necessary to create mechanisms that would make it easier for both beginners and experienced farmers to acquire land as a basic factor of production. It is also important to create conditions enabling agricultural land to continue to serve its purposes and be acquired by persons who are competent for the management of the land and will manage it in compliance with the criteria of good agricultural and environmental practice. Research and analysis of factors affecting the land market and the rental market with agricultural land will also play an important role in these directions. During the evaluated period 2007–2016, we analyzed 244,374 land plots of agricultural land in twelve districts of the Slovak Republic (hereinafter referred also as SR). In the twelve districts of Slovakia, from 2007 to 2016, the average market price agricultural land without a distinction of size categories showed a fluctuating trend. Higher values of the average market price of agricultural land were recorded in the first years of the reviewed period. The highest value of the average market price was recorded in 2008 and amounted to 2.76 €.m^{-2}. During the monitored period, from 2007 to 2011, the average market price had always values exceeding 1 €.m^{-2}. In the reviewed twelve districts of Slovakia during the monitored period, the sold area of agricultural land represented acreage of 100,574 ha. From this acreage, the largest share (58.41%) scored arable land followed by permanent grassland with a share of 40.92%. Orchards marked the 0.43% share of the total acreage and the smallest share (only 0.23%) of the total sales was represented by vineyards.

Keywords: Agricultural land, land price, land plots, sale, average market price

The development of land market is directly proportional to the agro-sector performance and the profitability of individual agricultural entities. Effective use of agricultural land has a significant impact on the harmonized economic and environmental parameters of production at both national and regional level. In particular, ownership and land use relationships, but also the existing natural assumptions of the regions, play a decisive role. The further direction of the development of the land market, the rental market and the taxation of agricultural land is also important (Buday, Čičová, Grausová and Buday, 2015; Lazíková et al., 2012; Voltr et al.,2015). Besides economic performance, it is also necessary to point out that the land markets need proper institutional environment and the reduction of frictions that may hamper their performance (Holst, Eberlin and Onera 2012).

Agricultural land accounts for more than half of the area of Slovakia. Agriculture in Slovakia has a long tradition; it has always been self-sufficient in basic foodstuffs and has been able to apply to foreign markets for commodity markets. According to research realized by Vilcek and Koco, in terms of agricultural production potential, 15.3% of soils in Slovakia are very highly productive, 22.2% are highly productive, 24.0% are medium, 15.0% are low-productive and 23.5% are very low-productive agricultural soils. The resulting integrated index of agricultural soils quality in Slovakia indicates 1.0% of very high quality, 30.3% of high quality, 37.9% of medium quality, 30.5% of low quality and 0.3% of very low quality of soils (Vilček and Koco, 2018).

According to Žďárková (2002), soil is further understood as an advantageous capital thesaurus, not subject to inflation. As the world's land is fixed, the number of people on the planet is growing with increased demands on space and livelihood, and it also needs to be emphasized that, above all, high-quality farmland is and will be the desired investment. Growth in agricultural land prices in the world has been strong in recent years, influenced by non-food use of agricultural land and its decline in terms of both quantitative and qualitative aspects. According to the European Environment Agency (2003), Europe is one of the most intensively used continents in the world. The way it is used is one of the major causes of environmental change that has a significant impact on quality of life and ecosystems and on infrastructure management. However, it is important to control the extent of agricultural land and its numerous functions – food production, nature conservation, recreation and housing. Increasing land-use for urbanization is primarily at the expense of farmland. Therefore, the Common Agricultural policy gave priority to subsidies primarily linked to the agricultural land itself

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(Single Farm Payment), to enhance market orientation. The change from mainly production related subsidies to land subsidy, raised further still the need for reliable and comparable prices on agricultural land (European Commission, 2013). The level of land prices depends on a number of national (laws), regional (climate, proximity to networks) and localised factors (soil quality, slope, drainage etc.) as well as the market forces of supply and demand (including influence of foreign ownership rules). As such, it is interesting to note developments in prices for regions over time. According to the European Commission (2018), the land prices vary considerably between and within the Member States, and Slovakia belongs to the countries with large differences within region in arable land prices.

The analysis of structure of agricultural land prices and agricultural land transactions was published by various authors (Plantinga, Lubowski and Stavins, 2002; Buday and Vilček, 2013; Buday et al., 2016; Rumanovská, 2014; Vilhelm et al., 2013). According to them there are efforts to understand potential threats to agriculture posed by land development and to identify policies to prevent or discourage what may be considered socially undesirable land-use changes. Land prices reflect not only land use, but also its potential use. In a competitive market, the price of land will equal the discounted sum of expected net returns (or utility) obtained by allocating the land to its most profitable use. That use surely may change over time. If, for example, agricultural production is currently the most profitable use, but development for some other purpose is expected to yield even greater net returns in the future, then the current land price should reflect both uses in a simple additive form: the sum of the discounted stream of near-term rents from agriculture plus the discounted stream of expected rents from development beginning at some time in the future. Based on the mentioned research it is important to focus on the developments of agricultural land market transactions. According to Baran, Bandlerová, Takáč and Straňák (2012), elimination of the distortive effects that affect the price of land and the unification of tax levy could ultimately bring the necessary impetus to the launch of this market segment. The creation of mechanisms that would facilitate the beginners and also experienced farmers to get the basic means of production – land – is referred as important.

The paper focuses on the analysis of transactions on the agricultural land market in selected districts of Slovakia. The analysis was carried out using data from the annual monitoring of land market from the Bonita Bank of Data (BBD) of the Research Institute of Agriculture and Food Economics. Data from the BBD are mainly used in the decision-making sphere when creating concepts and directions of the Common agricultural policy in the Slovak Republic conditions, providing regular information for the needs of the Statistical Office of the SR, Eurostat and the monitoring report for the OECD.

Material and methods

The basic data for the analysis of the paper was the data on the agricultural land market, in selected regions of Slovakia, obtained from the cadastre of real estate transactions on land in twelve selected districts of the SR from 2007 to 2016. The selected regions were Banská Bystrica (BB), Dunajská Streda (DS), Košice-okolie (KE), Liptovský Mikuláš (LM), Michalovce (MI), Nitra (NR), Prešov (PO), Rimavská Sobota (RS), Svidník (SK), Topoľčany (TO), Trnava (TT), Žilina (ZA). The most important monitored variables were: district code, the code of the cadastral area, parcel number, land price in €.m^{-2}, the plot, plot location code, and date of land transfer. For the evaluation, the data from selected sale and purchase contracts related to agricultural land transfers reported for a deposit according to cadastral territories in selected districts for the period of the relevant (evaluated) calendar year were used.

The collected data were examined in terms of location. Land located in local municipalities was excluded for evaluation purposes. Further, the data was reviewed for the type of land, and the type of garden plot was excluded from the assessment. The data were supplemented with the names of the regions. Additionally, size categories and size ranges were added to the dataset.

Outputs in MS Excel were evaluated both by immediate analysis of specific values, which is more suitable for files smaller and medium sized as well as methods of statistical analysis.

In order to compare the sold areas within the cadastral territories/districts with the total area of the respective cadastral area / district, the existing databases on agricultural land area, type of land and data from Informational sheets from the Ministry of Agriculture and Rural Development of SR were used.

Data transformation and processing was performed using the UNIX operating system, the INFORMIX database system, and a structured SQL query language. In addition to the analytical tools of Excel, statistical software SPSS (Statistical Package for Social Sciences) and NCC software (Number Cruncher Statistical Software) were used for statistical evaluation.

Results and discussion

Intensity of sales and purchases transactions of agricultural land in the twelve districts of Slovakia from 2007 to 2016

In the twelve selected districts of Slovakia for the period from 2007 to 2016, we analyzed 244,374 plots with agricultural land. From this number, 66.58% were plots with arable land. Another major share on the total plots was land with permanent grassland, namely 32.75%. The share of sold vineyards represented only 0.54% and the share of sold orchards was even smaller, only 0.13%.

The largest amout of sold agricultural land was in the district of Liptovský Mikuláš and accounted for 18.00% of the total land sold. Next in line was Žilina, where the number of sold plots was 14.16%. These were followed by the districts of Rimavská Sobota (13.54%) and Košice-okolie with a sales share of 12.37%. The least amount of plots with agricultural land was sold in the Svidník district (1.28%). Most plots of arable land were sold in the Žilina region, representing 13.98%, followed by Liptovský Mikuláš (13.18%) and

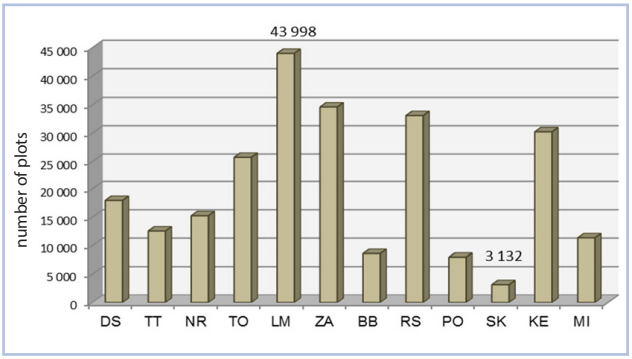

Figure 1 Number of sold land plots in the twelve districts of the SR in the years 2007 to 2016
Source: VUEPP, author's calculations, 2018

Košice-okolie with 13.15%. Next in order were the districts Rimavská Sobota (12.60%) and Topoľčany (12.50%). The districts with the least number of sold plots of arable land included Banská Bystrica (2.39%) and Svidník (1.49%). The sale of land under permanent grassland in terms of their number was the largest within the Liptovský Mikuláš district (28.09%), followed by the districts of Rimavská Sobota (15.15%) and Žilina (14.78%). The lowest numbers of plots under permanent grassland were sold in Trnava (1.66%) and the district Svidník, only 0.88%. Within the selection of twelve districts, vineyards were sold in seven districts. Most vineyard plots were sold in the districts of Nitra (42.70%) and Rimavská Sobota (31.63%). The smallest share of vineyards in the total number of vineyards sold was in Košice-okolie district (0.38%). The districts with the largest share of orchard sales were Liptovský Mikuláš (25.39%) and Košice-okolie (23.51%). On the other hand, the low proportion of land sales with orchards was in the Banská Bystrica district (0.63%) and the same in the Michalovce district (0.63%). The lowest share of orchard sales was in the Svidník district and amounted to 0.31%.

The sold acreage of agricultural land in the twelve districts of Slovakia for the period 2007–2016 represented the total amount of 1 005 739 673 m^2 (about 100,574 ha), as shown in table 1. Of this total area, arable land accounted for the largest share (58.41%), followed by permanent grassland, whose share amounted to 40.92%. Orchards share of total sales amounted to 0.43% and the smallest share (only 0.23%) of total sales were represented vineyards.

The evaluation of the amount of agricultural land sales from the regional point of view showed that the Košice-okolie district (25.61%) was the district with the highest selling rate, followed by Rimavská Sobota (24.04%) and the third in row was the Topoľčany district, where the sold area accounted for 16.48% of the total sales of agricultural land. To the districts with the lowest acreage of sold agricultural land belongs Banská Bystrica (1.60%), Žilina (1.59%) and Svidník (1.54%).

The largest acreage of arable land was sold in the Topoľčany district (23.67%), followed by Košice-okolie (19.58%) and Rimavská Sobota , where arable land sales amounted to 18.72%. A small acreage of arable land was sold in the districts of Žilina (1.47%), Svidník (1.38%) and the smallest share of arable land was sold in Banská Bystrica (0.84%). Regarding the sales of permanent grassland, there dominated the district Košice-okolie, where the sold area represented 34.62% of the total area of sold permanent grasslands, followed by the district of Rimavská Sobota with a share of 31.46% sold permanent grassland. The smallest area of permanent grasslands in the period under review was sold in the districts of Nitra (1.62%), Trnava (1.17%) and Dunajská Streda (0.77%). The largest area of vineyards from the evaluated districts was sold in the Nitra district (40.91%). Next in line was the district Rimavská Sobota (29.91%). The smallest share of vineyard sales was in the Košice-okolie district (0.59%). The district Topoľčany dominated by the sold area of the orchards, where the sold area represented 62.70%. Next in line was the district

Table 1 Acreage of agricultural land sold in the period from 2007 to 2016 in the twelve districts of the SR by type of land

District	Acreage (m^2)				
	agricultural land	arable land	vineyards	orchards	permanent grassland
Dunajská Streda	34 492 792	31 046 959	119 889	143 286	3 182 658
Trnava	60 468 376	55 386 917	268 567	14 991	4 797 902
Nitra	58 996 929	51 205 010	958 729	173 240	6 659 949
Topoľčany	165 704 244	139 028 611	227 937	2 724 939	23 722 757
Liptovský Mikuláš	42 951 763	20 650 613	–	311 601	21 989 549
Žilina	15 974 115	8 660 255	–	22 647	7 291 213
Banská Bystrica	16 098 536	4 921 521	–	755	11 176 260
Rimavská Sobota	241 781 288	109 980 621	700 840	862 919	130 236 908
Prešov	31 751 899	17 469 255	–	27 840	14 254 804
Svidník	15 504 401	8 108 639	–	1 860	7 393 901
Košice-okolie	257 575 569	115 021 583	13 872	59 753	142 480 361
Michalovce	64 439 762	25 993 127	53 595	2 000	38 391 040
Total	1 005 739 673	587 473 112	2 343 430	4 345 831	411 577 300

Source: VUEPP, author's calculations, 2018

Rimavská Sobota (19.86%). The districts with the smallest share of the sold area of orchards were Trnava (0.34%) and Michalovce (0.05%).

The average market price of agricultural land in twelve districts of Slovakia for the period 2007 to 2016

The average market price of agricultural land for a period of ten years (2007–2016) in the selected set of twelve districts of Slovakia had a value of 0.84 €.m^{-2} (Table 2). According to the type of land, the highest average market price was monitored by vineyards. Their average market price was 2.84 €.m^{-2} for the whole monitored period, followed by arable land, with the average market price of 1.05 €.m^{-2}. The next, according to the average market price, were orchards with an average market price of 1.00 €.m^{-2}. The lowest average market price was recorded by permanent grasslands, which amounted to 0.52 €.m^{-2}.

The evaluation by district showed that for the period from 2007 to 2016, the highest average market price of agricultural land was in the Žilina district and its value was 4.13 €.m^{-2}. Next in line was the district Prešov with the value of 2.72 €.m^{-2} and the third was the Banská Bystrica district, where the value of the average market price of agricultural land was 2.70 €.m^{-2}. In the next group of districts, the average market price of agricultural land was significantly lower than the above mentioned prices. Three districts were located in the production areas of Dunajská Streda (1.65 €.m^{-2}), Trnava (1.63 €.m^{-2}) and Nitra (1.44 €.m^{-2}). Even slightly lower price was recorded within the districts – up to 1.25 €.m^{-2}. In the other monitored districts, the average market price of land was below 1 €.m^{-2}. The lowest average market price of agricultural land was in the Michalovce districts (0.25 €.m^{-2}) and Svidník (0.21 €.m^{-2}).

The highest value of the average market price of arable land over the monitored period of ten years was recorded in the Žilina district (5.23 €.m^{-2}), followed by the Prešov district with the value of 4.03 €.m^{-2} and the third in row was the Banská Bystrica district (2.66 €.m^{-2}). The ranking of other districts according to the amount of the average market price of arable land was similar to the market price of agricultural land, followed by the districts of Dunajská Streda (1.74 €.m^{-2}), Trnava (1.73 €.m^{-2}) and Nitra (1.44 €.m^{-2}). To the districts with the lowest average market price of arable land belong the districts of Rimavská Sobota (0.31 €.m^{-2}), Svidník (0.28 €.m^{-2}) and Topoľčany (0.27 €.m^{-2}).

The average market price of permanent grassland was highest in the district of Žilina, where it was 2.82 €.m^{-2}. The second highest price was marked in the district of Banská Bystrica where the average market price of permanent grasslands was 2.72 €.m^{-2} followed by the district of Prešov where the average market price amounted to 1.04 €.m^{-2}. In other districts, the average market price of permanent grassland was below 1 €.m^{-2}. The lowest average market price of permanent grassland was recorded in the Svidník district (0.14 €.m^{-2}) and in the Michalovce district (0.07 €.m^{-2}).

The highest average market price of vineyards was recorded in the district of Nitra, where the selling price was 5.53 €.m^{-2}. Then, the district Dunajská Streda followed with an average market price of vineyards amounting to 4.51 €.m^{-2}. The lowest average market price of vineyards was in the districts of Rimavská Sobota (0.19 €.m^{-2}) and Košice-okolie (0.15 €.m^{-2}).

The highest average market price of orchards was in the Prešov district (35.11 €.m^{-2}), followed by the Košice-okolie district (22.73 €.m^{-2}) and the relatively high average market price of the orchards was also recorded in the district of Trnava (19.86 €.m^{-2}). The lowest average market price of orchards was in Rimavská Sobota (0.17 €.m^{-2}), Topoľčany (0.15 €.m^{-2}) and Michalovce (0.03 €.m^{-2}).

Table 2 The average market price of land in twelve selected districts of Slovakia by type of land for the period from 2007 to 2016

District	Price (€.m^{-2})				
	agricultural land	arable land	vineyards	orchards	permanent grassland
Dunajská Streda	1.65	1.74	4.51	2.79	0.63
Trnava	1.63	1.73	1.40	19.86	0.53
Nitra	1.44	1.44	5.53	1.05	0.81
Topoľčany	0.33	0.27	0.90	0.15	0.70
Liptovský Mikuláš	1.25	1.79	–	1.71	0.73
Žilina	4.13	5.23	–	2.37	2.82
Banská Bystrica	2.70	2.66	–	6.00	2.72
Rimavská Sobota	0.29	0.31	0.19	0.17	0.28
Prešov	2.72	4.03	–	35.11	1.04
Svidník	0.21	0.28	–	2.44	0.14
Košice-okolie	0.81	1.23	0.15	22.73	0.47
Michalovce	0.25	0.53	1.98	0.03	0.07
Total	0.84	1.05	2.84	1.00	0.52

Source: VUEPP, author's calculations, 2018

Year-to-year comparison of the development of the land market in the twelve districts of Slovakia from 2007 to 2016

Development of the number and acreage of sold land plots

The number of sold land plots and the sold acreage of agricultural land in the selected twelve districts of Slovakia showed a fluctuating trend from 2007 to 2016 as shown in Figure 2. Lower number of plots and smaller acreage of land were recorded in the first half of the evaluated period (2007–2011). Since 2012, there has been an increase in the number of sold plots and sold acreage of land. Boths values culminated in 2014. During the first eight years, the development of land plots was more or less identical to the development of land acreage sales. In 2015, there was a partial decrease in the number of sold land plots compared to the previous year, but the decrease in sold acreage of land was more significant. The same development was recorded in 2016. This fact shows that in the most recent years, land plots with a small or smaller acreage dominated by the land sales.

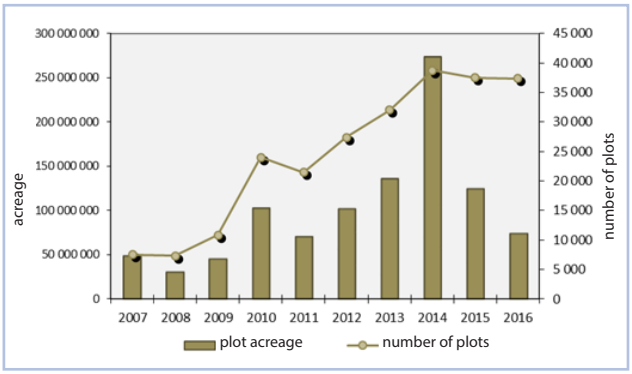

Figure 2 Development of the number of land plots and the acreage of sold agricultural land in the twelve districts of Slovakia between 2007 and 2016
Source: VUEPP, author's calculations, 2018

Evaluation of the development of the average market price of agricultural land in the monitored twelve districts of Slovakia from 2007 to 2016

Within the selected twelve districts of Slovakia in the period from 2007 to 2016, the average market price of agricultural land showed a fluctuating trend (Figure 3). Higher values of the average market price of agricultural land were recorded in the first monitored period. The highest value of the average market price was recorded in 2008 and amounted to 2.76 €.m^{-2}. During the monitored period from 2007 to 2011, the average market price exceeded 1 €.m^{-2}. In 2012, for the first time since 2007, the average market price of agricultural land fell below 1 €.m^{-2}, up to 0.67 €.m^{-2}. In 2013, the average market price partially increased, but next year decreased again and the lowest value was recorded during this period, amounting to 0.41 €.m^{-2}. Since 2014, the average

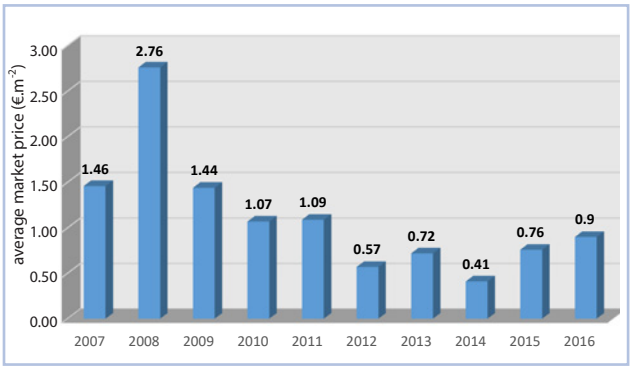

Figure 3 Development of the average market price of agricultural land without distinction of the size categories for the twelve districts of Slovakia from the year 2007 to 2016
Source: VUEPP, author's calculations, 2018

Table 3 Development of the average market price of agricultural land in the twelve districts of Slovakia from the year 2007 to 2016

District	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2007–2016
DS	1.64	3.09	1.83	2.62	2.34	1.81	0.75	1.34	1.09	0.94	1.65
TT	2.94	6.40	2.91	2.07	0.96	0.67	0.39	0.65	1.01	2.78	1.63
NR	2.31	4.89	1.93	2.30	1.36	1.56	0.38	0.61	0.62	2.13	1.44
TO	0.33	1.02	0.68	0.18	0.68	0.30	0.18	0.18	0.45	0.55	0.33
LM	4.19	4.83	1.51	0.90	0.70	0.77	0.69	0.65	1.46	2.17	1.25
ZA	4.88	3.22	2.75	4.73	4.37	3.47	4.68	3.39	5.70	9.80	4.13
BB	5.06	5.25	2.77	5.28	7.07	8.09	2.31	2.37	7.07	1.63	2.70
RS	0.11	0.16	0.15	0.45	0.23	0.27	0.74	0.17	0.16	0.23	0.29
PO	0.76	4.25	1.69	1.91	6.41	6.34	3.11	1.84	5.05	4.13	2.72
SK	0.08	0.50	0.11	0.04	0.27	1.38	0.01	0.14	0.73	0.20	0.21
KE	2.14	3.49	1.13	1.13	1.04	0.80	0.93	0.36	0.84	2.56	0.81
MI	1.97	0.98	1.50	0.15	1.04	0.19	0.05	0.01	0.24	0.22	0.25
Total	1.46	2.76	1.44	1.07	1.09	0.67	0.72	0.41	0.76	0.90	0.84

Source: VUEPP, author's calculations, 2018

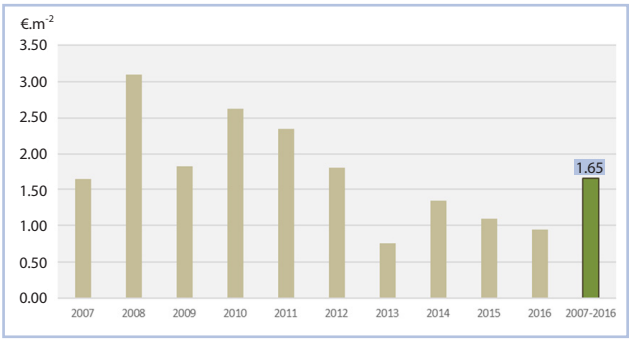

Figure 4 Development of the average market price of agricultural land in the district of Dunajská Streda from 2007 to 2016
Source: VUEPP, author's calculations, 2018

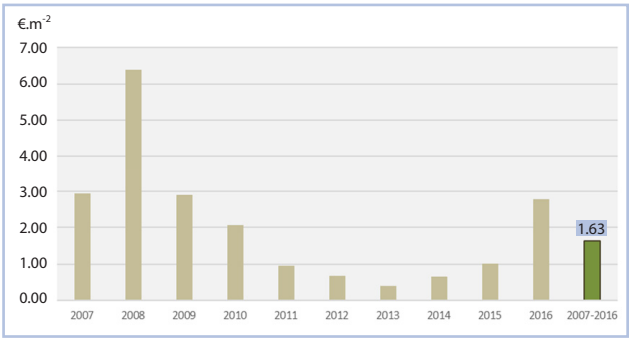

Figure 5 Development of the average market price of agricultural land in the Trnava district from 2007 to 2016
Source: VUEPP, author's calculations, 2018

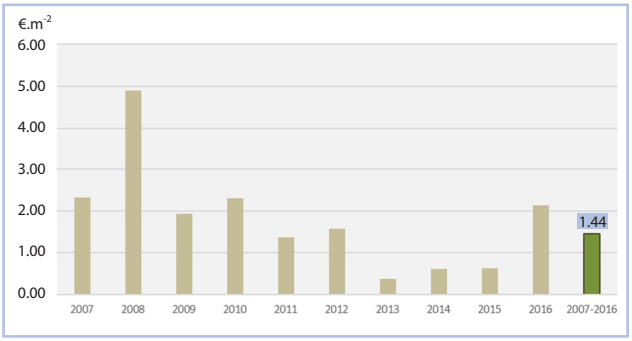

Figure 6 Development of the average market price of agricultural land in the Nitra district from 2007 to 2016
Source: VUEPP, author's calculations, 2018

market price has risen again, but its value has not reached 1 €.m^{-2}. The difference between the lowest and highest average market prices during the period under review was 2.35 €.m^{-2}. In the last evaluated year, the average market price of agricultural land rose by 0.14 €.m^{-2} compared to the previous year.

Development of the average market price of agricultural land between 2007 and 2016 in the different districts of Slovakia was significantly different and in most districts had a fluctuating course (Table 3). In the half of the monitored districts, the maximum value of the average market price of land during the evaluated period was recorded in 2008. In contrast, the lowest average market price in five of the twelve districts was reported in 2013.

The district of Dunajská Streda was one of the districts that had the highest average market price of agricultural land (3.09 €.m^{-2}) in 2008, as shown in Figure 4. After a temporary reduction in 2009, the relatively high price for agricultural land (more than 2 €.m^{-2}) was maintained in 2010 and 2011. Once again, after the reduction in 2012, the price fell in the next year (2013) to the lowest value during the monitored period, amounting to 0.75 €.m^{-2}. In 2014, there was an increase in the average market price, to 1.34 €.m^{-2}, but from this year on, the average market price of land in the district has declined. In the last evaluated year, the average market price of agricultural land was 0.94 €.m^{-2}. Although there was a decrease and an increase in the average price during the period under review, there were no significant differences between the prices in the individual years. The difference between the highest and the lowest average market price in the reference period was 2.34 €.m^{-2}. The average market price in this district for the entire monitored period was 1.65 €.m^{-2}.

The development of the average market price of agricultural land in the Trnava district was also fluctuating (Figure 5). Higher values of the average market prices were recorded in the first evaluation period. The highest average market price was (as in the Dunajská Streda district) found in 2008 and its value was 6.40 €.m^{-2}. This value was significantly higher compared to the values in 2013 and 2014 (where the values were the lowest), but also compared to the relatively high value of the average market price in 2007 and 2009. The difference between the highest and lowest average market price was 6.01 €.m^{-2}. Since 2008, the average market price gradually declined until 2013 to the lowest level (0.39 €.m^{-2}). Then there followed a gradual increase in the value of average market prices and in the last reporting year, it amounted to 2.78 €.m^{-2}. The average market price of agricultural land for the whole monitored period was 1.63 €.m^{-2}.

In the district Nitra there was also monitored a fluctuating trend in the development of the average market price of agricultural land (Figure 6). Also, in this district, the highest average market price (4.89 €.m^{-2}) was recorded in 2008. In the following period, the average market price decreased and increased sharply. The lowest value of the average market price was reported in 2013, similarly as in the previous districts, when its value was only 0.38 €.m^{-2}. In the following years, the average market price gradually increased to 2.13 €.m^{-2} in 2016. Between the highest and lowest average market price there was in this district also considerable difference, which amounted to 4.51 €.m^{-2}. The average market price for the whole period had the value of 1.44 €.m^{-2}.

In the Topoľčany district there were no significant differences in the average market prices of agricultural land recorded during the monitored period 2007–2016 (Figure 7). Although throughout the period the price fluctuated, the difference between the highest and the lowest recorded average market prices was only 0.84 €.m^{-2} and it was one of the lowest differences within the selected twelve districts. The highest average market price, as in all previous districts, was recorded in 2008, when it was 1.02 €.m^{-2}. During the

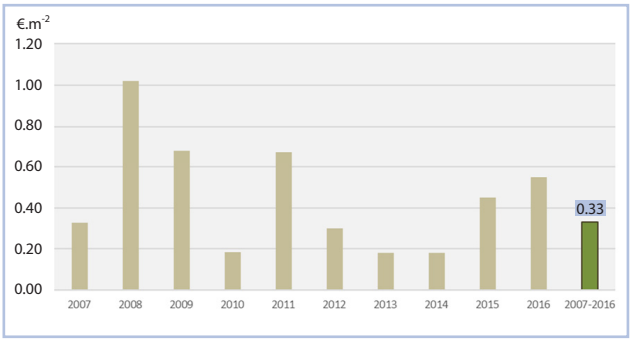

Figure 7 Development of the average market price of agricultural land in the Topoľčany district from 2007 to 2016
Source: VUEPP, author's calculations, 2018

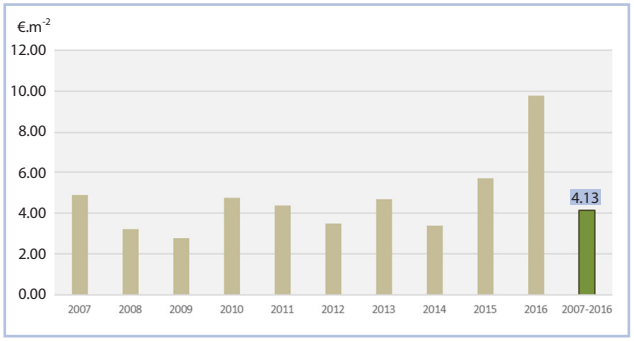

Figure 9 Development of the average market price of agricultural land in the Žilina district from 2007 to 2016
Source: VUEPP, author's calculations, 2018

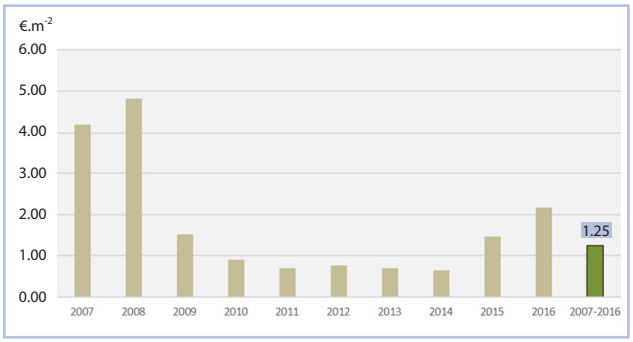

Figure 8 Development of the average market price of agricultural land in the Liptovský Mikuláš district from 2007 to 2016
Source: VUEPP, author's calculations, 2018

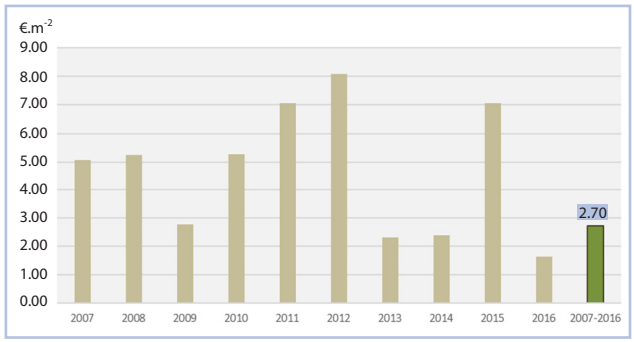

Figure 10 Development of the average market price of agricultural land in the Banská Bystrica district from 2007 to 2016
Source: VUEPP, author's calculations, 2018

following years, the average market price had a fluctuating trend. The lowest average market price (0.18 €.m^{-2}) was recorded in three years, namely, in 2010, 2013, and 2014. In the last two years, the average market price of agricultural land increased and in 2016 it had the value of 0.55 €.m^{-2}. For the period 2007–2016, the average market price of agricultural land was 0.33 €.m^{-2}.

Liptovský Mikuláš had the highest values of the average market prices in the first two years of the evaluated period (Figure 8). Also this district recorded in 2008 the highest average market price. Its value at that time was 4.83 €.m^{-2}. Until the year 2011, average market prices of agricultural land declined gradually. In the period from 2012 to 2014, the average market price had a fairly balanced pattern. In 2014, it recorded its minimum value of 0.65 €.m^{-2}. In the last two monitored years, the average market price recorded an increase, but it did not reach the value of the first two monitored years. Its value in 2016 was 2.17 €.m^{-2}. In this district, there were also large differences between the average market prices in individual years. The difference between the highest and lowest average market price was 4.18 €.m^{-2}. The value of the average market price of agricultural land for the whole monitored period was 1.25 €.m^{-2}.

In the Žilina district (unlike the previous districts), the highest average market price was recorded in 2016 (Figure 9). In this district, relatively high values of the average market price were recorded throughout the whole monitored period. However, the extremely high value of the average market price was found in the last evaluated year and reached 9.80 €.m^{-2}. This increase was due to the high land prices near urban areas assuming their future recreational status. The development of the average market price of agricultural land during the years 2007 to 2016 was very fluctuating. The average market price of agricultural land from the first reference year in the following two years decreased to the minimum value (2.75 €.m^{-2}) in 2009. After fluctuating development of land price, it increased significantly in 2015 to 5.70 €.m^{-2}. The difference between the highest and lowest average market price was 7.05 €.m^{-2}, the highest value of the difference in price of all twelve districts. The average market price of agricultural land in the assessment period had the value of 4.13 €.m^{-2}.

Also, the district of Banská Bystrica was one of the districts with considerably high average market price during the monitored period 2007 to 2016, as shown in Figure 10. The average market price of agricultural land, which in the first years had the value of 5 €.m^{-2}, decreased to 2.77 €.m^{-2} in 2009. Since then, it has increased up to the maximum value of 8.09 €.m^{-2} in the monitored year 2012. Over the next two years, its value declined significantly to the value of over 2 €.m^{-2}, but in 2015, an increase was monitored up to 7.07 €.m^{-2}. In the last year, during the monitored period, there was a significant decrease in the average market price of agricultural land to the lowest value for the whole reference period, which was 1.63 €.m^{-2}. We can note that even in this district the development of the average market price had significant fluctuations and also recorded one of

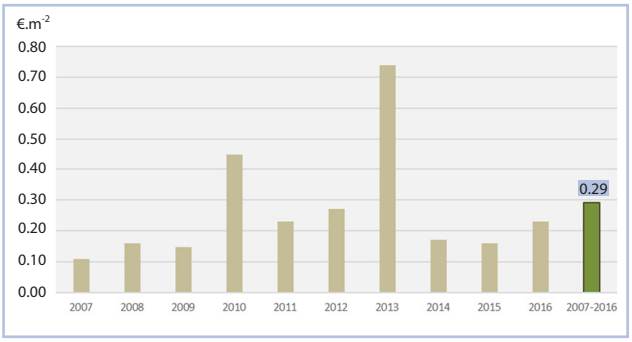

Figure 11 Development of the average market price of agricultural land in the Rimavská Sobota district from 2007 to 2016
Source: VUEPP, author's calculations, 2018

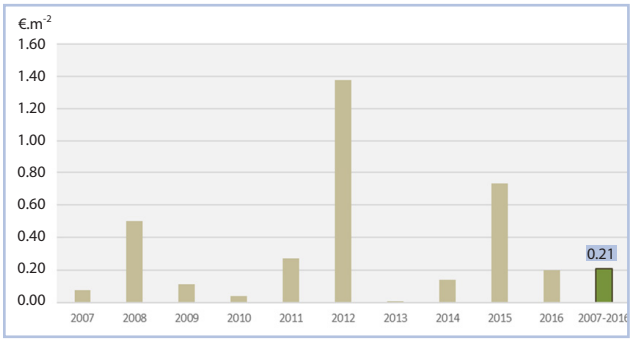

Figure 13 Development of the average market price of agricultural land in the Svidník district from 2007 to 2016
Source: VUEPP, author's calculations, 2018

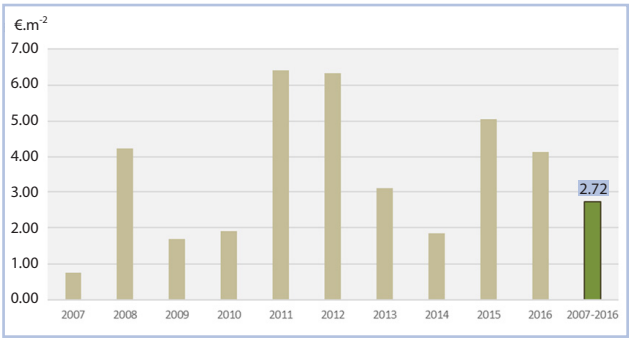

Figure 12 Development of the average market price of agricultural land in the Prešov district from 2007 to 2016
Source: VUEPP, author's calculations, 2018

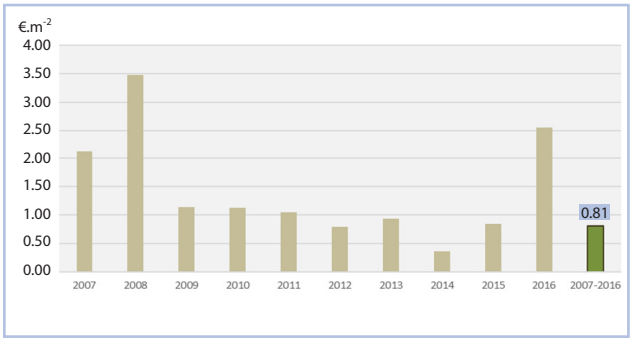

Figure 14 Development of the average market price of agricultural land in the Košice-okolie district from 2007 to 2016
Source: VUEPP, author's calculations, 2018

the biggest differences between the highest and the lowest average market price, which was 6.46 €.m^{-2}. The average market price of agricultural land for the whole monitored period had the value 2.70 €.m^{-2}.

The district of Rimavská Sobota belongs to the districts with the lowest average market price of agricultural land (Figure 11) within the evaluated period and had the value of 0.29 €.m^{-2}. The lowest average market price was recorded at the beginning of the reference period and amounted to only 0.11 €.m^{-2}. During the whole period, the increase and decrease of the average market price varied, but they were not very significant. The difference between the highest and lowest average market prices in the monitored period was only 0.63 €.m^{-2} and was the lowest one within the rated districts. One of the larger increases in the average market price of agricultural land was recorded in 2010, when the average market price was 0.45 €.m^{-2}. The largest increase in the average market price of agricultural land in the Rimavská Sobota district was in 2013, when the average market price was 0.74 €.m^{-2}. In the last monitored year, the average market price was 0.23 €.m^{-2}, as in one of the previous years (2011).

The fluctuations in the average market price during the period 2007–2016 were also recorded in the Prešov district (Figure 12). The average market price of agricultural land for the whole monitored period was 2.72 €.m^{-2}. Closest to this figure was the average market price in 2013, when it was 3.11 €.m^{-2}. Four years during the period under review, the average market price was less than 2 €.m^{-2}. The lowest value (0.76 €.m^{-2}) was recorded in the first evaluation year. In the five years within the period 2007 and 2016, the average market price in the Prešov district was quite high. Twice it exceeded the value of 4 €.m^{-2}, once of 5 €.m^{-2} and twice of 6 €.m^{-2}. Overall, during the ten monitored years, the average market price had the highest value in 2011 and amounted to 6.41 €.m^{-2}. The difference between the highest and lowest values of the average market price was significant and amounted to 5.66 €.m^{-2}.

The district Svidník belongs to the districts where the difference between the highest and lowest average market price during the reporting period was very high and amounted to 1.37 €.m^{-2} (Figure 13). Although, as in most districts, the average market price displayed fluctuations during the period under review, they were not extreme. More significant fluctuation in the average market price occurred in the half of the monitored period, when in 2012, the average market price rose from 0.27 €.m^{-2} and in the year 2011 to the highest value for the whole period of 1.38. €.m^{-2}. Even more significant was the fluctuation when the highest average market price in 2012 decreased to the lowest value (0.01 €.m^{-2}) within the monitored period. In this district, the lowest average market prices are reported during the reference period. The average market price of agricultural land for the whole period was 0.21 €.m^{-2}.

In the district Košice-okolie the development of the average market price during the whole monitored period

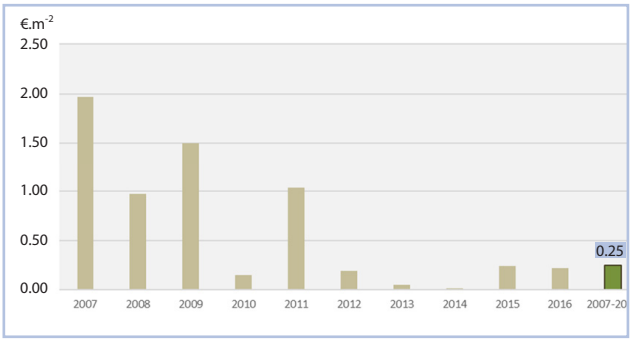

Figure 15 Development of the average market price of agricultural land in the Michalovce district from 2007 to 2016
Source: VUEPP, author's calculations, 2018

2007–2016 was quite balanced (Figure 14). The highest values of the average market prices were recorded in the first monitored period. In 2008, the average market price reached the value of 3.49 €.m^{-2} and this was the highest value during the whole monitored period. During the period from 2009 to 2015, the market prices were stable. The lowest average market price was in the year 2014 and had the value of 0.36 €.m^{-2}. The difference between the highest and lowest average market prices in the monitored period was 3.13 €.m^{-2}. In the last evaluated year, after the long-term equilibrium of the average market price, it increased significantly to 2.56 €.m^{-2}. The average market price of agricultural land in the district Košice-okolie was 0.81 €.m^{-2} throughout the monitored period.

The Michalovce district belongs to districts with a relatively low average market price during the reference period (Figure 15). Even in this district, fluctuations in the average market price occurred during the period under review. The district of Michalovce is the only one where the highest average market price was recorded in the first monitored year 2007 and amounted to 1.97 €.m^{-2}. After declines and increases in the average market price in the first half of the reviewed period, the amount of the average market price has stabilized since 2012. Also, in the second half of the monitored period there was a slight fluctuation, namely the decrease of the average market price in 2014 to the lowest value during the monitored period, which amounted to 0.01 €.m^{-2}. The difference between the highest and lowest average market price in this region amounted to 1.96 €.m^{-2} and belongs to less significant within the sample of the twelve districts. The value of the average market price of agricultural land for the period from 2007 to 2016 was 0.25 €.m^{-2}.

Conclusion

During the evaluated period from 2007 to 2016, we have analyzed 244 374 plots with agricultural land in the twelve districts of Slovakia. From this number of plots, the ones with arable land represented 66.58% and plots with permanent grassland had the share of 32.75%. The share of sold vineyards represented only 0.54% and the share of sold orchards was even smaller, only 0.13%.

Based on the regional division by districts, the largest number of land plots with agricultural land was sold in the Liptovský Mikuláš district and represented 18.00% of the total sold plots. On the second place there was the district of Žilina, where the share of sold plots was 14.16%. Then, there followed the districts of Rimavská Sobota (13.54%) and Košice-okolie with a sales share of 12.37%. The lowest number of plots with agricultural land was sold in the Svidník district (1.28%).

In the reviewed twelve districts of Slovakia during the period 2007–2016, the sold area of agricultural land represented an acreage of 1,005,739,673 m2 (about 100,574 ha). From this acreage, arable land created the largest share (58.41%), followed by permanent grassland with a share of 40.92%. Orchards had the 0.43% share of the total acreage and the smallest share (only 0.23%) of the total sales was represented by vineyards.

The evaluation of sales of agricultural land from a regional point of view showed that the Košice-okolie district (25.61%) was the district with the highest selling rate, followed by Rimavská Sobota (24.04%) and the Topoľčany district, where the area sold accounted for 16.48% of the total sales of agricultural land. To the districts with the smallest sold area of agricultural land belong the districts of Banská Bystrica (1.60%), Žilina (1.59%) and Svidník (1.54%).

In the selected set of twelve districts of Slovakia for the period 2007–2016, the average market price of agricultural land was 0.84 €.m^{-2}. According to the type of land, the highest average market price was observed by the vineyard in the amount of 2.84 €.m^{-2}, followed by arable land with an average market price of 1.05 €.m^{-2}. The next, according to the average market price, were orchards with an average market price of 1.00 €.m^{-2}. The lowest average market price was reported by permanent grassland in the amout of 0.52 €.m^{-2} over the reporting period.

The evaluation by districts showed that for the period 2007–2016 the highest average market price of agricultural land was in the Žilina district and its value was 4.13 €.m^{-2}, followed by the Prešov district, with the value of the average market price of agricultural land of 2.72 €.m^{-2} and the third district in the order was Banská Bystrica, where the average market price of agricultural land was 2.70 €.m^{-2}. The lowest average market price of agricultural land was in the districts of Michalovce (0.25 €.m^{-2}) and Svidník (0.21 €.m^{-2}).

The number of sold plots and the sold acreage of agricultural land within the analyzed sample of the twelve districts of Slovakia showed a fluctuating trend in 2007–2016. Lower numbers of plots as well as smaller acreage were recorded in the first half of the evaluated period (2007–2011). Since 2012, there has been recorded an increase in the number of sold plots and sold acreage. Both were culminating in 2014.

In the twelve districts of Slovakia, in the period 2007–2016, the average market price of plots with agricultural land without a distinction of size categories showed a fluctuating trend. Higher values of average market prices of agricultural land were recorded in the first years under the reviewed period. The highest value of the average market price was recorded in 2008 and amounted to 2.76 €.m^{-2}. During the monitored period 2007–2011, the average market price had the value exceeding more than 1 €.m^{-2}. The year 2012 was the first when the average market price of agricultural land fell below 1 €.m^{-2} to 0.67 €.m^{-2}. The average market price increased in 2013, but in the following

year, the price declined again and recorded the lowest value during the reference period, falling to 0.41 €.m^{-2}. Since 2014, the average market price has increased again but its value has not reached 1 €.m^{-2} .

Acknowledgment

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THE DEVELOPMENT OF CHOSEN SOCIAL AND ECONOMIC INDICATORS IN RURAL AREAS OF THE SLOVAK REPUBLIC

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The focus of the following article was to study development of certain social and economic indicators in Slovakia. We focused this paper on two types of regions in Slovakia, urban and rural. For this purpose we decided to measure the development of inhabitants in rural and urban areas as well as median age of the population. We also partially focused on the sector of agriculture since it used to play an important role in rural areas as a key employer. We found that there is a trend of moving people from urban to rural areas and that agriculture is losing its key role because of decreasing employment trend. This can be caused by low attractiveness of this sector and low income which, nowadays, plays an important role in finding a job.

Keywords: rural areas, agriculture, employment in agriculture, rural women

Nowadays, approximately half of the land in the EU is used for agricultural purposes. In 2013, there were 10.8 million farms across the EU utilizing 174.4 million hectares of land which represented approximately 40% of the total land fund. The average size of agricultural holding in the EU was 16.1 hectares (EC, 2015). Due to past reforms of CAP, the methods of utilizing the land are more environmental friendly with positive impact on rural areas. Approximately half of the EU population lives in rural areas. More than half of the EU land fund can be found in regions classified as predominantly rural (Eurostat, 2012). The OECD has defined predominantly rural region as having more than 50% of the population living in rural communities with population density over 150 persons per square kilometre (Beshiri and Bollman 2001). There are some differences between rural areas. In general, rural settlements near towns can be characterized as dynamic and stable, whereas settlements farther from town can be characterized with declining overall development as turbulent (Niittykangas, 2006). Agriculture sector plays different role in European countries, e.g., agriculture in Central and Eastern European countries is a much more important component of the economy than in industrialized countries. It traditionally accounted for 15–20% of GDP and total employment, compared to only 2–3% in the rest of the EU (Klomp, 2014). Due to economic development in certain regions the farmers try to improve their activities. One of these is taking over the land which was previously used by their competitors. This results in decrease of employment in agriculture and an increase of average farm size (Beckers et al., 2018). Nowadays in Slovakia, there is a similar situation like in the rest of the EU. In 2012, over 50% of inhabitants lived in predominantly rural areas, almost 40% lived in intermediate regions and 11.4% lived in predominantly urban areas. When considering the area, 59% of the area belongs to predominantly rural areas, almost 37% consisted of intermediate regions and 4.2% consisted of predominantly urban areas. In total, 95.8% of regions can be considered rural (PRV, 2014). Agriculture can be considered as the main economic activity in majority of rural areas.

The agricultural sector has been related to production of essential food crops for hundreds of years, being the main source of livelihood for many people. The fundamental role of agriculture in economic development of many countries around the world has long been recognized (Alston and Pardey, 2014). The agricultural activity may also have several other functions beyond its role of producing food and fibre, which has emerged as a key notion in scientific and policy debates regarding the future of agriculture and rural development. Current and future members of community profit from rural areas utilized by farmers (EC, Agriculture, 2014). In 2011, about 42% of the 26.7 million people working regularly in agriculture in the EU were women and at least one holding out of five (around 29%) was managed by a woman. Women play a major role in civil society and in economic growth in rural areas all over the world (Franic et al., 2015).

Rural areas can also be defined by Eurostat methodology which is based on two hierarchical levels of territorial units – local (municipal) and regional. Municipality, on local LAU 2 level, is considered a settlement with density lower than 150 inhabitants per km^2. On regional level, there are three types of regions: predominantly rural regions, where 50% of inhabitants live in countryside; intermediate regions, where 15–50% of inhabitants live in countryside and predominantly urban regions where only 15% of inhabitants live in countryside. In Slovakia, there are 79 districts on LAU 1 level out of which 70 can be considered rural. Predominantly rural

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regions consist of 31 districts and the rest are intermediate regions. There are only two predominantly urban regions, the districts with the two biggest cities in Slovakia, Bratislava, the capital in the western Slovakia, and Košice in eastern Slovakia (Buchta, 2012).

Predominantly rural areas have certain specifics when compared to predominantly urban regions. To the main features belong lower concentration of capital, lower concentration of inhabitants which limits the demand for goods and services. There is also lower education level of inhabitants as well as lower vitality index. In countryside, there is lack of certain localization factors which bring to entrepreneurs agglomeration effects such as level of infrastructure, number and size of entrepreneurs (Fáziková, 2009). Despite the negative features, countryside has been becoming more attractive over the past years, especially countryside near the cities. Since the beginning of 90's, the rural areas have undergone certain changes such as renewal of local municipalities, public administration reforms and decline of certain economic sectors – agriculture and forestry. The accession of Slovakia into the EU brought regulations in primary production, regional development and tourism. All these changes formed the current state of rural areas (Gajdoš, 2015).

Material and methods

Rural areas represent a dynamic and constantly changing environment. The main goal of the following paper is to describe chosen social and economic indicators in rural areas through analysis of basic data. Our aim is to find new trends in rural areas before and after entering the EU. The theoretical base is provided by several authors operating in the field. The data we used can be found on web pages of the Slovak statistical office, Eurostat database and Green reports done by the Research Institute of Agricultural and Food Economics. When drawing data from these databases we found that there are different time series. Some data were found since 1993, some since 1994, 1996 or 2000. Nevertheless, we used this data to describe the development of these indicators in rural areas. The data were later used to calculate the trend and graphically expressed in MS Excel charts. For the purposes of this article we did not focus on a specific regions; we only used basic division to rural and urban regions in the Slovak Republic. When considering employment rate in rural areas, our assumption was based on general knowledge that in rural areas the main employer is the sector of agriculture. For the purposes of this article, we focused on the following indicators:

- demographic development in rural and urban areas in Slovakia,
- changes in median age of inhabitants in rural and urban areas,
- development of unemployment rate in Slovakia and in rural areas,
- development of employment rate in agriculture since the 90's,
- analysis of average nominal wages in chosen sectors of economy,
- analysis of current situation in agriculture and employment rate.

Results and discussion

In the past, agriculture significantly participated in economic development of rural areas. Some said it was a key actor in employment in rural areas. The economic structure of countryside was based on traditional rural sectors such as agriculture, forestry and fishery. Nowadays, there is an increasing importance of other sectors which can effectively use local resources, e.g. rural tourism, agro-tourism and traditional craftsmanship. There can also be other sectors, those that increase the quality of life, such as social services (Gajdoš, 2015). Of course, the countryside simply cannot provide advantages compared to concentrated capital in urban areas. On the other hand, countryside can provide effective forms of organisation and cooperation in agriculture, food processing and forestry. Rural areas can provide better base for creating associations among businessmen, municipalities and partnerships which help the development of municipality and tourism (Gajdoš, 2015). There are, and there will be, differences between rural and urban ways of life. The fact is that majority of Slovak inhabitants live in urban areas, but the quality of their life is connected to rural areas, when considering the quality of environment, primary production, active free time in nature, cultural and historical sightseeing. The trend in residency was changing during 1993–2015 period. At the beginning and during the 90´s, there was a tendency of living in urban areas, but later after 2000, there was a shift towards living in rural areas. The causes of moving to cities were different e.g. better job opportunities, education, civic amenities, access to services or the quality of infrastructure.

There were recorded changes at the beginning of the new millennium. We can see an increase of population in rural areas and this trend has continued up to today. The rural areas are especially attractive for young families who are looking for a quiet lifestyle in combination with lower living costs (Dugovič, 2015). Among other advantages of rural areas we can mention higher availability of land and cleaner and healthier environment. The migration to rural areas can be seen in the whole region of Slovakia. The Figure 2 shows us the changes in urban – rural migration by sex. We can see that not only women form a higher share in population, but also both sexes have increasing tendency of living in rural areas.

The trend in this migration is also supported by the changes in median age in urban and rural areas (Figure 3). Since 2000, there has been recorded lower median age in rural areas (38 years) than in cities (40). This chart can support the hypothesis that younger people are moving from urban to rural areas. Rural areas have been experiencing a new boom; people leave the comfort of big cities, good infrastructure and advanced services (Dugovič, 2015). The reason for this migration can be the desire for a family house that is often financially unsustainable in cities. A family house is considered to be the best way of living that can be achieved and is connected with the ideas of a happy life (Gajdoš, 2012).

On the other hand, from the overall point of view, the age of population is constantly rising in both rural as well as urban regions indicating population ageing which can lead to several social and economic problems. The increasing

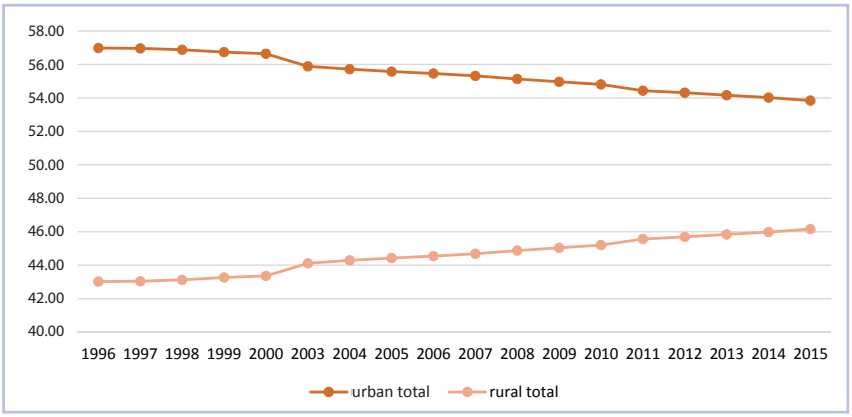

Figure 1 Development of population in urban and rural areas during 1996–2015 period in %
Source: Statistical Office of the Slovak Republic, 2017

Figure 2 Share of population in urban/rural area by sex during 1993–2015 period in %
Source: Statistical Office of the Slovak Republic, 2017

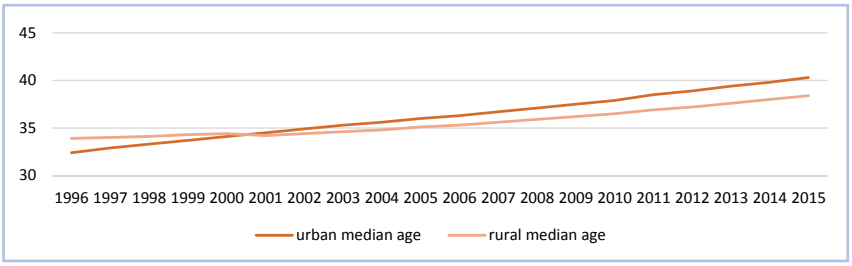

Figure 3 Development of median age in urban and rural areas
Source: Statistical Office of the Slovak Republic, 2017

share of seniors in the future will be reflected in every developed economy as well as in the structure of its population consumption (TASR, 2016). Changes in the number, increase, distribution and age structure of population, caused by changes in the reproductive and family behaviour of population will have a serious impact on social development. Impact will affect all areas of societal life, first of all the labour market, social insurance, health care and social services (Vaňo, 2015).

Unemployment in Slovakia

Every country tries to achieve the lowest or natural unemployment rate. Employment rate represents the economic health condition of a country. Therefore, unemployment is considered a severe economic and social feature with multiple negative effects on the whole society (Uhnák, 1998). Unemployment is a social problem, but in flexible economy there exists a natural unemployment rate which is considered a naturally occurring feature connected to permanent economy structure (Stanek et al., 2002). The development of unemployment has been changing in Slovakia since the creation of the Slovak Republic in 1993. The most critical period can be considered from 2000 to 2002. Another critical period showed up after the 2008 economic crisis. In Slovakia, the negative effects started to be observed in the following years of 2009 and 2010. This crisis had a negative effect on GDP growth as a result of decreased foreign demand for Slovak production. Industrial sector was the most affected area as it is considerably dependent on development of world markets. All these negative effects resulted in higher rate of redundancies (Laurová, 2012).

The unemployment rate in rural areas is considerably higher than in urban areas. There are several reasons which explain this situation. One of the most significant reasons is insufficient educational and qualification structure of human resources, low mobility and connection to agriculture (Fáziková, 2005). Although the unemployment rate is decreasing during the studied period, there are still differences between males and females. The unemployment rate of females is higher than in case of males (Fig. 4). Since agriculture is still one of the important sectors in rural areas, the following text will focus on employment in agriculture. When considering the employment in general, the share of agriculture is low, but the ability to create new jobs is higher than in other sectors. This job position in rural areas, unlike in other sectors, does not require high mobility or building the follow-on infrastructure such as housing, transportation, etc. (Buchta, 2015). Generally, in Slovakia, the share of agriculture on employment has a long term decreasing tendency, but when looking at the situation in rural areas, this share is higher than on the national level. Nowadays, agriculture cannot be seen as the main source of employment in rural areas. It is necessary to take into account the difference between permanent and seasonal employees. Among the employees, there is an ageing trend. The share of employees younger than 35 years has been decreasing. On the other hand, there was an increase of older employees who are over 60 years old. These are mainly small farms

holders of up to 5 ha (Kováčik et al., 2016). Various factors contributed to redundancy in agriculture. Utilizing the land has become more advanced, new technologies have been supplying human resources, and this trend is increasing. Conventional farming is capable of larger production using less human resources and time. Decrease of import duties and "removing" the borders had resulted in larger and cheaper variety of products (especially fruits and vegetables) interesting for consumers. This can be seen as another factor which, in the end, helped to decrease the job supply in agricultural sector. The farmers had to change their production structure in order to become more competitive to foreign products.

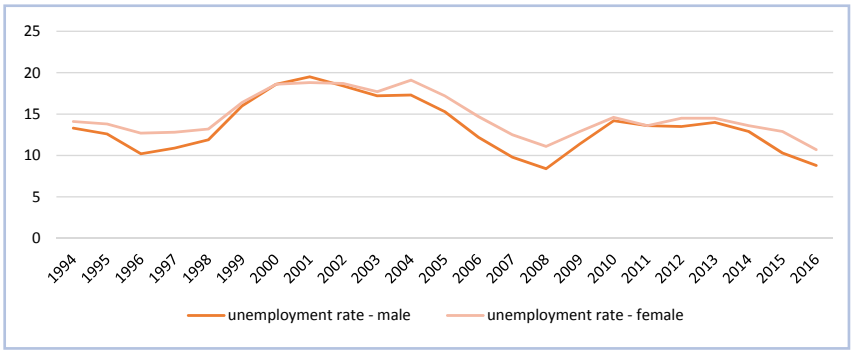

Figure 4 Development of unemployment rate in Slovakia in %
Source: Statistical Office of the Slovak Republic, 2017

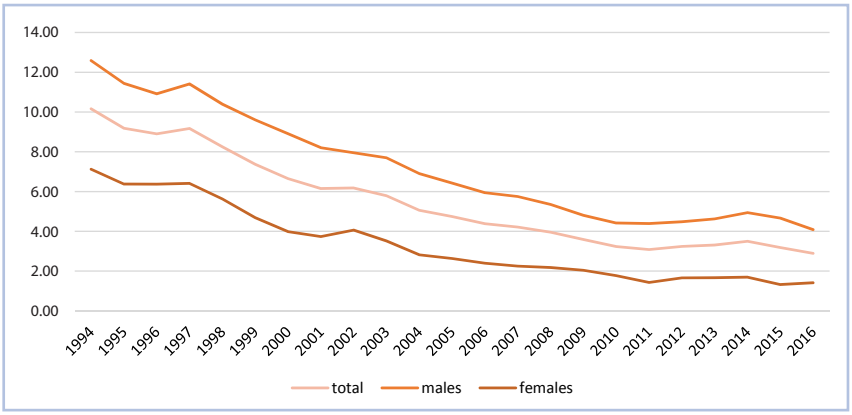

Figure 5 Development of employment in the sector of agriculture in Slovakia 1994–2016 in %
Source: Statistical Office of the Slovak Republic, 2017; RIAFE 2017

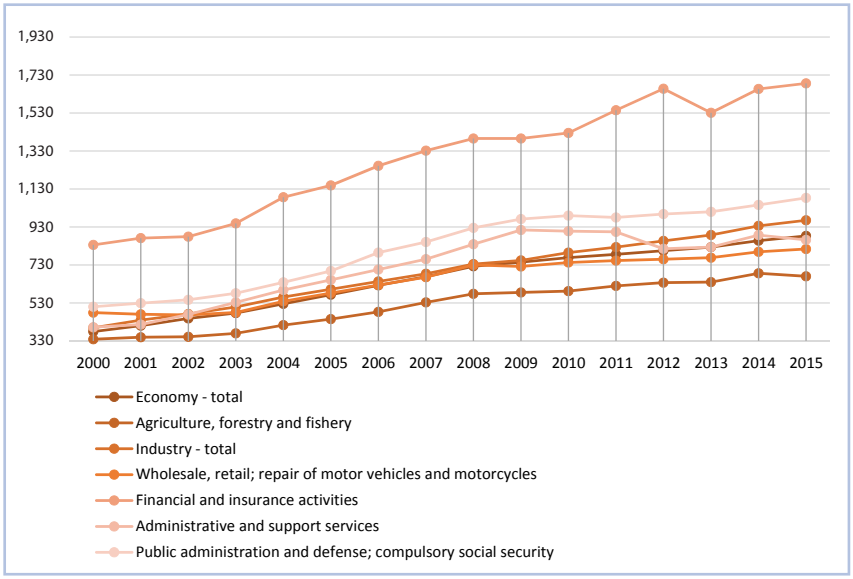

Figure 6 Average monthly income in absolute values in €
Source: Statistical Office of the Slovak Republic, 2017

In the end, we need to take into account that employment in agriculture has become less attractive for younger people and working in rural areas is not in accordance with their perception of life. But it is necessary to state that this phenomenon can be seen in all EU member countries. In 2012, 10.3 million of people were employed in agriculture in EU-28. In 2014, this number decreased by over 600,000 people. Based on Eurostat (2016), the highest share of agriculture on employment (over 10%) can be seen in countries like Romania (16.6%), Greece (12.9%), Poland (12.2%), Croatia (12.1%), Lithuania (11.4%) and Hungary (11.3%).

Since the beginning of the 1990's, a constant decrease of employment in agriculture has been observed. Of all the people employed in agriculture, women constituted ¼. From long-term point of view, this share has not been changing. In 2014, there was a slight increase of this share by 1.4% compared to 2013. This slight increase has resulted from the activities realized under the Rural Development Programme of the Slovak Republic 2007–2013. This programme contained measures aimed at job creation in the sector of agriculture. Changes can also be observed in the structure of employees. In recent period, there is an increase of administrative workers and a decrease of "traditional" manual workers.

Changes can also be observed in the structure of employees. The age of the employees is also rising due to low interest of younger generation (Riafe, 2016). In the past years, there has been an increase of administrative workers and a decrease of "traditional" manual workers. On the other hand, employment in agriculture does not seem attractive when considering the level of income. On the figure 6 we can see differences in average monthly income in selected branches of economy. We can see that income in agriculture is the lowest and also with the lowest development. The highest income was in the sector of financial and insurance activities.

Labour assessment in agriculture is different when considering the sex of employees. Qualified estimates show us that average salaries of women are 20% lower compared to men (Buchta, 2008).

Conclusion

Rural areas are characterized by their specifics which have undergone several changes during the previous years. Not only the rural areas are changing, but also the human perception of rurality is changing. During the 1990–2015 period, we saw several changes in selected indicators. Firstly, there are changes in living preferences towards the rural areas. After the year 2000 there can be seen significant migration from urban to rural areas. Especially, the "middle generation" is looking for living in a calm rural area.

The rural areas are naturally connected to agriculture as its main employer. Recently there have begun changes towards non-agricultural services and therefore this sector has undergone several changes in the past years. The number of people working in agriculture has been constantly decreasing. Among the causes of this development we can include the innovation and modernisation of agricultural sector and the low job attractiveness due to the level of income. Low salary and, usually, the hard-physical work repel the possible young labour force.

These events contributed to changes, shaping rural areas. Despite the increase of inhabitants in rural areas, the employment rate remains lower. Most of the newcomers continue to work in urban areas and use the rural areas only for living without further economic impact. The results of this paper can be used for further study of rural areas in Slovakia as well as a comparison with other EU member states; particularly with "2004" new member states in comparison to EU-15 states in order to see the similarities or differences in rural development in the EU.

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STRUCTURE OF HOUSEHOLD EXPENDITURES IN SLOVAKIA AND RELATIONS BETWEEN ITS CATEGORIES

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Household income is one of the basic indicators of the living standard of population in countries or regions. The income indicator is inextricably linked to the household expenditure indicator, whose structure also indicates the living standards of households. The development of income and expenditures of Slovak households has been affected by many events over the last decades (fulfilment of the Maastricht criteria, accession of the Slovak Republic to the EU, adoption of the euro currency, economic crisis). The category of gross cash expenditures, net cash expenditures or consumption expenditures may be used to assess household expenditures. Based on the classification by individual consumption by purpose (COICOP), the expenditures are divided into 12 basic categories. The development of individual categories of expenditures, however, should be analysed separately as there is no long-term balanced relationship between them.

Keywords: expenditures, categories, long-term balanced relationship

Income and expenditures of inhabitants can be observed by using two main methods. First one is looking at the final consumption of households within the system of national accounts and the second one is based on observing income and expenditures at the micro level based on the data from family accounts. The first method is based on analysing data of all inhabitants. The second method uses incomes and expenditures of representative sample of households, so called family accounts (Kaščáková and Nedelová, 2008). In the statistics of family accounts, the data for consumption expenditures (goods and services) and non-consumption (other) expenditures are collected (Vojtková and Labudová, 2010).

The current structure of the consumption expenditures of majority of Slovak households is the result of economic factors, in particular, the level of their income and the price changes of goods and services. However, the consumption of our households is also affected by the financial and economic crisis, while individual households deal with the impacts of crises differently (Vidová, 2015). Experience shows that the total consumption depends on the size of the disposable income and the level of the interest rate. The higher the interest rate, the lower the inclination to consumption, i.e. that consumption is a declining function of the real interest rate. At the same time, with the growth of income, consumption also increases, which means that consumption is a function of disposable income. Consumption includes durable goods (household equipment, cars), nondurable goods (food, clothing, energy) and services (housing, health care, education, recreation) (Lisý et al., 2011). In addition to the economic indicators, the development of structure and level of consumption is also influenced by many social and geographical factors, such as the structure of society by age and education, rate of price regulation, degree of economic development of the country, consumer traditions, etc. (Kollárová and Vladová, 2009). In the structure of consumption, the so-called Engel's law is valid: the more money someone has, the smaller portion of expenditures is used for the necessary living needs. In practice it can be seen for example by decreased share of expenditures spent on food and increased share used on health care, recreation, culture, etc. (Pauhofová and Páleník, 2012). High share of consumption in relation to income leads to low investments and slowdown of economic growth (Lisý et al., 2011).

Generally, expenditures represent outflow of money from households (Meyer and Sullivan, 2003), by other words, household expenditures represent all cash used to cover the needs of household members. In the developed countries, household expenditures spent on the purchase of consumption goods and services account for two thirds of the total spending (Lisý et al., 2011). The largest debit items of households consist of food, housing, water, electricity, gas and other fuels and transport (Frendáková, 2010).

The Statistical Office of the SR (2017) lists three groups of expenditures. Gross cash expenditures include consumption expenditures and other gross expenditures, i.e. other expenditures including income tax and compulsory personal insurance. Net cash expenditures include consumption and other net expenditures, i.e. other expenditures excluding income tax and compulsory personal insurance. The term other expenditures refers to expenditures for various payments (property tax and

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other, other gross expenditures also income tax and compulsory personal insurance), cash donations outside the household, instalment loans, purchase of shares and bonds, including short-term expenditures on private management (Statistical Office of the SR, 2017). The third group consists of consumption expenditures, which represent the amount of expenditures for goods and services.

The Statistical Office of the Slovak Republic, as well as the European Statistical Office EUROSTAT, classify household expenditures according to their purpose into 12 categories, referred to as COICOP (Classification of Individual Consumption by Purposes).

Material and methods

This article focuses on the structure of money expenditures divided by COICOP (Classification of Individual Consumption by Purpose) into 12 categories and the existence of a long-term balanced relationship between categories through a correlation matrix and cointegration tests.

The Statistical Office of the Slovak Republic uses the classification of the surveyed items within the family accounts statistics COICOP. Household expenditures are broken down by the purpose, which means according to the purpose, for which the money is spent or what component of the standard of living the goods and services satisfy. From 1997 to 2014, the COICOP-HBS classification was used; the COICOP-5 classification has been used since 2015 (Statistical Office of the SR, 2017). Based on the COICOP classification and in accordance with the Eurostat methodology, expenditures are broken down into 12 categories: food and non-alcoholic beverages; alcoholic beverages and tobacco; clothing and footwear; housing, water, electricity, gas and other fuels; furnishing, household equipment and routine household maintenance; health; transport; mail and telecommunications; recreation and culture; education; hotels, cafés and restaurants; miscellaneous goods and services (Statistical Office of the SR, 2017).

In order to identify the long-term balanced relationship between the expenditure categories, we used the Engle-Granger test, which consists of several steps. First, the stationarity of the selected pair of expenditures was tested, followed by cointegration regression, while the residuals were again subjected to a stationary test. For stationary testing, the Dickey-Fuller test was used, which means unit root test, where the zero hypothesis assumes that the time series has a unit root and, therefore, it assumes non-stationarity. The time series $Zt = \beta 0 + \rho Zt^{-1} + \varepsilon t$ is stationary when the condition $|\rho| < 1$ is fulfilled; if $\beta = 0$ and $\rho = 1$, then the time series is non-stationary (Dickey and Fuller, 1979).

Results and discussion

Expenditures and the Expenditures' Structure of Households

Generally, expenditures represent a cash outflow from households (Meyer and Sullivan, 2003). In developed countries, household expenditures spent on consumption goods and services accounts for two-thirds of total spending (Lisý et al., 2011). The largest debit items of household consist of food, housing, water, electricity, gas and other fuels and transport (Frendáková, 2010). These opinions are also confirmed by the Table 1, which shows the development of net cash household expenditures in Slovakia between 2004 and 2015.

However, this trend is presented not only in Slovakia, but also in the EU-28, as it is shown in Figure 1, where precisely these three selected categories represent the largest items of household expenditures.

There are, however, great differences between countries. In majority of the EU countries, expenditures on housing represent the largest share on the total expenditures, while the budgets of the new Member States are also burdened by the expenditures on food and non-alcoholic beverages (Dudek and Koszela, 2013), which proves the claim that economically less developed countries have higher expenditures on food and non-alcoholic beverages (Ševela, 2004). Food and non-alcoholic beverages represent the lowest expenditures in the UK (only 8.4% of the total expenditures), Luxembourg (9.4%) and Ireland (9.5%). On the contrary, food and non-alcoholic beverages in Romania (29.4%), Lithuania (23.4%) and Estonia (20.7%) account for the highest share on the total expenditures (Eurostat, 2016). The highest housing costs out of the total expenditures are in Denmark (29.7%) and Finland (28.2%), and the lowest in Malta (10.1%) and Lithuania (15.8%). Within the total expenditures, the transportation costs account for 7% to 16%, with the lowest costs in Slovakia, Spain and the Czech Republic, and the highest costs in Slovenia, Luxembourg and Bulgaria (Eurostat, 2016). The

Table 1 Total net cash expenditures in euros per person per month and selected expenditures from the total expenditures in % between 2004 and 2015

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total	234.75	244.57	280.61	304.16	324.69	306.62	307.76	320.8	322.61	320.58	321.71	354.53
Food and non-alcoholic beverages (%)	24.69	24.23	22.54	22.13	21.95	21.47	22.13	21.80	22.35	23.05	22.91	18.99
Housing. water. electicity. gas and other fuels (%)	22.40	20.96	21.74	19.85	19.54	20.00	20.43	20.21	20.36	20.05	19.93	18.86
Transport (%)	6.97	8.21	7.89	8.58	7.78	7.66	7.21	7.96	8.12	7.83	7.64	11.06

Source: Statistical Office of the SR, 2016

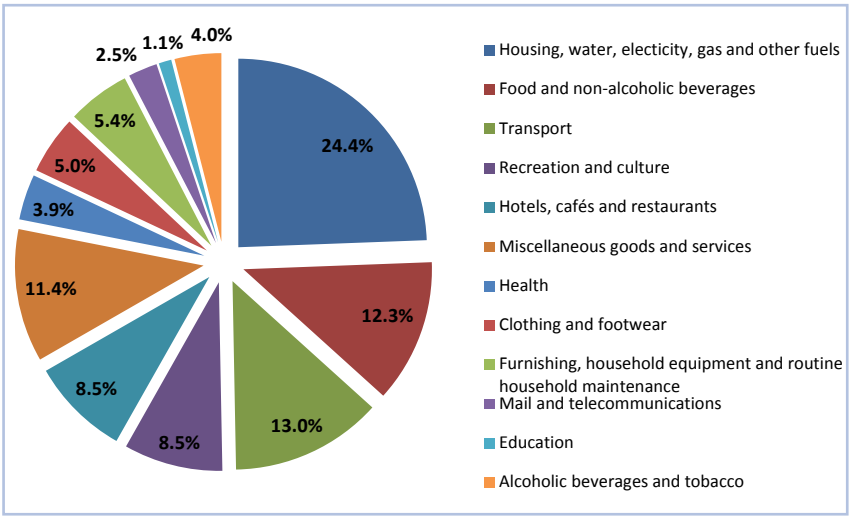

Figure 1 Structure of household expenditures in the EU-28 in 2015 in %
Source: own processing based on Eurostat, 2016a

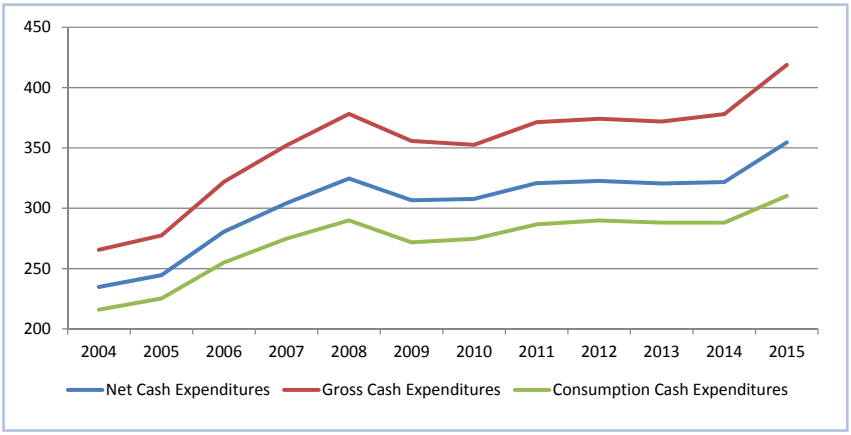

Figure 2 Development of gross, net and consumption cash expenditures between the years 2004 and 2015 in euros per month per one family member
Source: Statistical Office of the SR, 2016

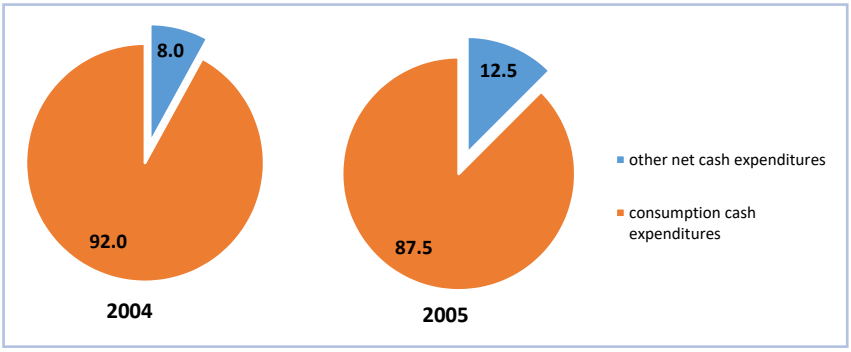

Figure 3 Comparison of the change in structure of net cash expenditures in 2004 and 2015 in %
Source: Statistical Office of the SR, 2016

above-mentioned statement on the size of the share of basic expenditures on the total expenditures can also be applied on individual households. Dudek, Koszela and Landmesser (2012) found out that the share of basic expenditures on the total expenditures grows with a decline in household wealth.

The category of gross or net cash expenditures can be used to assess household expenditures. Gross cash expenditures include consumption expenditures and other gross expenditures, i.e. other expenditures including income tax and compulsory contributions to the Social Insurance Agency and Health Insurance Companies. Net cash expenditures include consumption and other net expenditures, i.e. other expenditures excluding taxes and compulsory contributions to the Social Insurance Agency and Health Insurance Companies (Vojtková and Labudová, 2010). The term other expenditures refers to expenditures for various payments (property tax and other, other gross expenditures also income tax and compulsory personal insurance), cash donations outside the household, installment loans, purchase of shares and bonds, including short-term expenditures on private management (Statistical Office of the SR, 2017). The third group consists of consumption expenditures, which represent the amount of expenditures spent on goods and services. The difference in the development of gross, net and consumption cash expenditures is shown in Figure 2.

Gross, net and consumption expenditures of household have similar development (Figure 2). Over the years, similarly to the incomes, the gap between them increases. Whereas in 2004 the difference between net cash expenditures and gross cash expenditures was just under € 31 (i.e. 11.6%), in 2015 this difference was almost € 65 (i.e. 15.35%). The difference in consumption and net expenditures in 2004 was only € 19 (8%) and € 45 (12.5%) in 2015. In 2015, all of the aforementioned spending groups reached their maximum within the reference period. The second highest amount of expenditures was reached in 2008. In 2009, the gross cash expenditures dropped more than € 22 compared to 2008 (i.e. 5.95%). The other two spending groups recorded a decline of 5.6% in case of net cash expenditures and 6.3% in consumption expenditures. A further decline in expenditure amount was recorded in 2013 compared to 2012 with all groups decreasing by about € 2 (i.e. 0.62%).

When looking at the change in the development of net and consumption expenditures (Figure 2), it is also

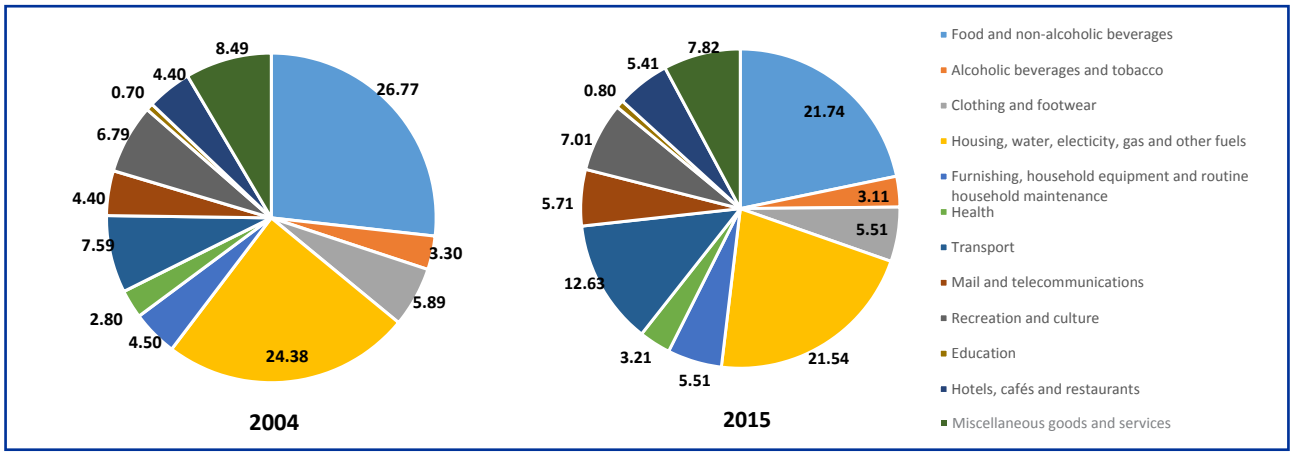

Figure 4 Comparison of the structure of household consumption expenditures in 2004 and 2015 in%
Source: Statistical Office of the SR, 2016

necessary to look at the structure of net cash expenditures (Figure 3).

Consumption expenditures of households in 2004 formed 92% of the net cash expenditures, while the remaining 8% was formed by the other net expenditures. In 2015, though, these other net expenditures increased by 4.5 percentage point at the expense of consumption expenditures.

Consumption expenditures, broken down by COICOP into 12 categories, have changed their structure over the reference period. The differences in categories of consumption expenditures in 2004 and 2005 can be seen in Figure 4. Consumption expenditures spent on food and non-alcoholic beverages were by 5.1 percentage point (p.p.) lower in 2015 than in 2004, the decline in the consumption expenditures was recorded also in the category "housing, water, electricity, gas and other fuels" by 2.9 p.p., expenditures spent on clothing and footwear, as well as alcoholic beverages and tobacco decreased slightly. The largest increase in consumption expenditures in 2015 compared to 2004 was reported in the category "transport" (by 5 p.p.) and "mail and telecommunication" (by 1.3 p.p.). The smallest increase, however, occurred in case of consumption expenditures spent on education (only by 0.1 p.p.).

Differences in the structure of expenditures can be observed not only over time, but also in the individual regions of Slovakia. According to Želinský and Tartaľová (2012), there are no significant differences in the basic structure of household consumption expenditures between the Slovak regions. The largest differences in percentage of total net cash expenditures between the regions of Slovakia were recorded in the categories "food and non-alcoholic beverages" (16.14–21.70%), "housing" (16.76–21.46%) and "recreation and culture" (4.76–7.08%) (Statistical Office of the SR, 2016).

Table 2 Structure of expenditures of the total net cash expenditures in 2015 in %

Region	BA	TT	TN	NR	ZA	BB	PO	KE
Food and non-alcoholic beverages	16.14	18.15	18.95	19.71	19.92	18.88	18.76	21.70
Alcoholic beverages and tobacco	2.69	2.49	2.84	2.69	2.73	2.58	2.68	3.11
Clothing and footwear	4.86	5.37	6.07	3.42	5.59	4.15	5.81	3.18
Housing, water, electicity, gas and other fuels	18.97	18.02	16.76	19.81	17.10	20.32	18.39	21.46
Furnishing, household equipment and routine household maintenance	4.93	4.46	5.80	4.83	4.52	5.02	4.66	4.54
Health	2.73	2.33	3.03	2.97	3.01	2.51	3.43	2.66
Transport	10.09	11.20	11.24	10.25	12.55	11.64	11.94	9.71
Mail and telecommunications	5.34	4.61	4.64	5.13	4.68	4.89	5.07	5.27
Recreation and culture	7.08	5.28	6.81	6.91	6.32	6.37	4.76	5.63
Education	0.56	0.63	0.74	0.66	0.97	0.63	0.55	0.89
Hotels, cafés and restaurants	5.12	4.11	5.09	4.25	5.52	4.04	5.08	4.20
Miscellaneous goods and services	6.71	6.52	7.06	6.77	6.95	6.88	6.66	7.25
Other net cash expenditures	14.77	16.82	10.97	12.59	10.14	12.10	12.21	10.40

Source: Statistical Office of the SR, 26. 1. 2016

The structure of expenditures in the individual regions generally confirmed the Engel's law cited above, stating that the higher the income, the lower the share of expenditures spent on essential living needs such as food, housing and transport. This is particularly confirmed by data on income and structure of expenditures from the Bratislava Region. However, while the lowest average equivalent household income was recorded in the Prešov Region, the share of expenditures spent on food and non-alcoholic beverages was lower than in majority of other regions of Slovakia. In the Bratislava Region, in 2015, only 16.14% of the total net cash expenditures was used for consumption of food and non-alcoholic beverages, while in the Košice Region, it was almost 22%. Category "housing, water, electricity and other fuels" in 2015 accounted for 16.76% of the total net cash expenditure in the Trenčín Region and more than 20% of the total net cash expenditures in the Banská Bytrica and Košice Regions. However, "transport" in the Košice Region accounted for only 9.71% of the total net cash expenditures and in the Bratislava Region by only 0.39 percentage points more, while in the Žilina Region it was up to 12.55% (by 2.85 p.p. more than in the Košice Region). Consumption of alcoholic beverages and tobacco represents the largest share of the total net cash expenditures in the Košice Region (3.11%).

Dependencies Between the Different Categories of Expenditures

Identifying of the long-term balanced relationship between expenditure categories was preceded by the identification of dependence between them using a correlation matrix. In particular, we were interested whether there is a strong dependence between the three categories of expenditures, which represent the largest item in the budgets of Slovak households. Those are namely the following categories: expenditures on food and non-alcoholic beverages; housing, water, gas and electricity; and transport. The correlation matrix shows the results of the dependence force (Table 3).

According to the correlation matrix, there is a strong correlation between the category "food and non-alcoholic beverages" and the category "housing, water, electricity, gas and other fuels" (0.9346); however, only moderate dependence was found between the categories "food and non-alcoholic beverages" and "transport" (0.6104). Similarly, there was shown only moderate dependence (0.6668) in correlation between categories "households, water, electricity, gas and other fuels" and "transport". A strong correlation was found between category "healthcare" on the one side and categories "food and non-alcoholic beverages" (0.9640), "alcoholic beverages and tobacco" (0.9681), "housing, water, electricity, gas and other fuels" (0.9570), and "telecommunications" (0.9563) on the other side. Contrary, even negative correlation was seen between the category "education" on the one side and categories "hotels, cafés and restaurants" (-0.0212) or "clothing and footwear" (-0.0372) on the other side. The category "education" has the strongest correlation with the category "miscellaneous goods and services" (0.82).

Long-term Balanced Relationships

Consequently, we were analysing the long-term balance relationships between the selected expenditure categories. Such relationship was manifested only in one case, between the categories "food and non-alcoholic beverages" and "recreation and culture".

Within the first step, we investigated the stationarity of both time series in a logarithmic shape using the unit root tests, namely the extended Dickey-Fuller test. Since both time series were non-stationary, we made their first differences, and tested the stationarity again (using the extended Dickey-Fuller test without a constant). The results of stationarity testing are documented in the Figure 6.

The aforementioned statements mean that in both cases we can reject the null hypotheses about the non-stationarity of the time series and confirm that time series for "food and non-alcoholic beverages" and "recreation and culture" are stationary since the *p*-value for the category "food and alcoholic beverages" equals to 0.03492 (<0.05) and *p*-value for the category "recreation and culture" equals to 0.007303 (<0.05).

In the second step, we performed the cointegrating regression of these two categories of expenditures using their logarithmic shapes (Figure 7).

This model reflects a long-term balanced relationship between

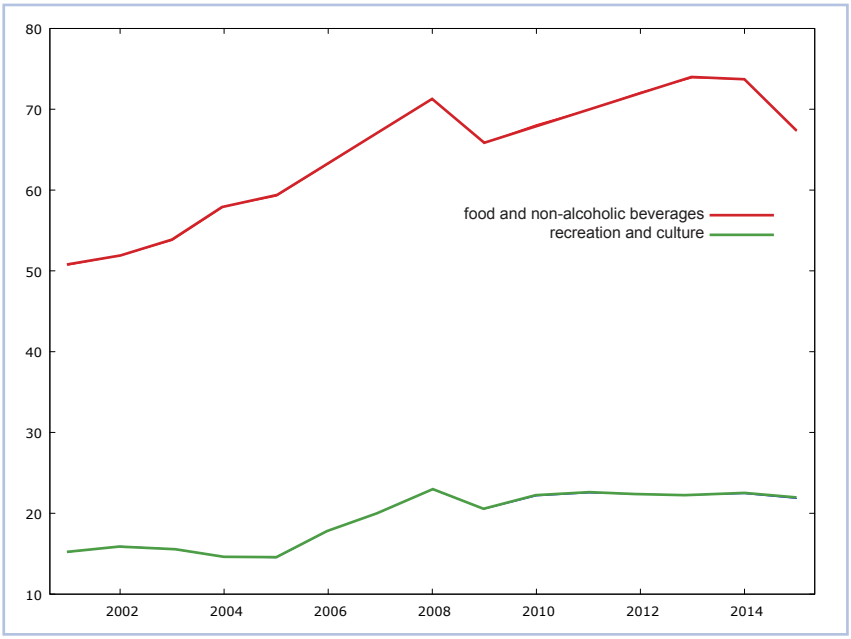

Figure 5 Evolution of the net cash expenditures for the categories "food and non-alcoholic beverages" and "recreation and culture" in euros per capita per month
Source: own processing in GRETL

Table 3 Correlation matrix of the structure of household expenditures

	A	B	C	D	E	F	G	H	I	J	K	L	M
A	1,000												
B	0,934	1,000											
C	0,423	0,391	1,000										
D	0,935	0,892	0,270	1,000									
E	0,468	0,474	0,737	0,522	1,000								
F	0,964	0,968	0,316	0,957	0,472	1,000							
G	0,610	0,706	0,515	0,667	0,831	0,688	1,000						
H	0,949	0,933	0,501	0,952	0,637	0,956	0,737	1,000					
I	0,918	0,915	0,700	0,825	0,628	0,880	0,684	0,937	1,000				
J	0,145	0,124	-0,037	0,352	0,584	0,219	0,622	0,255	0,031	1,000			
K	0,855	0,871	0,691	0,731	0,556	0,819	0,688	0,869	0,952	-0,021	1,000		
L	0,603	0,584	0,318	0,750	0,777	0,656	0,865	0,712	0,551	0,820	0,491	1,000	
M	0,823	0,886	0,623	0,837	0,793	0,867	0,879	0,936	0,911	0,320	0,872	0,740	1,000

Source: own processing of data

A – food and non-alcoholic beverages; B – alcoholic beverages and tobacco; C – clothing and footwear; D – housing, water, electicity, gas and other fuels; E – furnishing, household equipment and routine household maintenance; F – health; G – transport; H – mail and telecommunications; I – recreation and culture; J – education; K – hotels, cafés and restaurants; L – miscellaneous goods and services; M – other net cash expenditures

```
Augmented Dickey-Fuller test for d_l_Potraviny_nealkoholicke_n
including 0 lags of (1-L)d_l_Potraviny_nealkoholicke_n
(max was 5, criterion AIC)
sample size 13
unit-root null hypothesis: a = 1

  test without constant
  model: (1-L)y = (a-1)*y(-1) + e
  estimated value of (a - 1): -0,668012
  test statistic: tau_nc(1) = -2,15184
  p-value 0,03492
  1st-order autocorrelation coeff. for e: -0,072


Augmented Dickey-Fuller test for d_l_Rekreacia_kultura
including 0 lags of (1-L)d_l_Rekreacia_kultura
(max was 5, criterion AIC)
sample size 13
unit-root null hypothesis: a = 1

  test without constant
  model: (1-L)y = (a-1)*y(-1) + e
  estimated value of (a - 1): -0,817947
  test statistic: tau_nc(1) = -2,90362
  p-value 0,007303
  1st-order autocorrelation coeff. for e: 0,014
```

Figure 6 The results of the unit root tests for expenditure categories "food and non-alcoholic beverages" and "recreation and culture"
Source: own processing in GRETL

Model: OLS, using observations 2001-2015 (T = 15)
Dependent variable: l_Potraviny_nealkoholicke_nap

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	2,28009	0,245371	9,2924	<0,0001	***
l_Rekreacia_kultura	0,636549	0,0830255	7,6669	<0,0001	***

Mean dependent var	4,158008	S.D. dependent var	0,127734
Sum squared resid	0,041369	S.E. of regression	0,056411
R-squared	0,818895	Adjusted R-squared	0,804964
F(1, 13)	58,78150	P-value(F)	3,55e-06
Log-likelihood	22,91550	Akaike criterion	−41,83099
Schwarz criterion	−40,41489	Hannan-Quinn	−41,84608
rho	0,548046	Durbin-Watson	0,727709

Figure 7 Regression model for the expenditure categories "food and non-alcoholic beverages" and "recreation and culture"
Source: own processing in GRETL

```
Augmented Dickey-Fuller test for uhat27
including one lag of (1-L)uhat27
(max was 5, criterion AIC)
sample size 13
unit-root null hypothesis: a = 1

  test without constant
  model: (1-L)y = (a-1)*y(-1) + ... + e
  estimated value of (a - 1): -0,774593
  test statistic: tau_nc(1) = -4,77677
  asymptotic p-value 2,146e-006
  1st-order autocorrelation coeff. for e: -0,218
```

Figure 8 Stationarity test for the regression model residuals
Source: own processing in GRETL

the two categories of expenditures, assuming that the stationarity test for residuals confirms the residual stationarity of this model. Again, we used a unit root test (the extended Dickey-Fuller test) to test the stationarity of the model's residuals (Figure 8).

Based on the asymptotic p-value value (2.146×10^{-6} <0.05) it can be concluded that the model residuals are stationary. Therefore, we can conclude a long-term balanced relationship between the two categories of expenditures defined by the cointegration regression

```
Step 1: testing for a unit root in l_Potraviny_nealkoholicke_nap

Augmented Dickey-Fuller test for l_Potraviny_nealkoholicke_nap
including one lag of (1-L)l_Potraviny_nealkoholicke_nap
sample size 13
unit-root null hypothesis: a = 1

  test with constant
  model: (1-L)y = b0 + (a-1)*y(-1) + ... + e
  estimated value of (a - 1): -0,250064
  test statistic: tau_c(1) = -2,23407
  asymptotic p-value 0,1942
  1st-order autocorrelation coeff. for e: -0,158

Step 2: testing for a unit root in l_Rekreacia_kultura

Augmented Dickey-Fuller test for l_Rekreacia_kultura
including one lag of (1-L)l_Rekreacia_kultura
sample size 13
unit-root null hypothesis: a = 1

  test with constant
  model: (1-L)y = b0 + (a-1)*y(-1) + ... + e
  estimated value of (a - 1): -0,166288
  test statistic: tau_c(1) = -1,14349
  asymptotic p-value 0,7007
  1st-order autocorrelation coeff. for e: -0,016

Step 3: cointegrating regression

Cointegrating regression -
OLS, using observations 2001-2015 (T = 15)
Dependent variable: l_Potraviny_nealkoholicke_nap

                     coefficient  std. error  t-ratio  p-value
  ---------------------------------------------------------------
  const                2,28009     0,245371     9,292   4,19e-07
  l_Rekreacia_kult~    0,636549    0,0830255    7,667   3,55e-06

Mean dependent var   4,158008   S.D. dependent var   0,127734
Sum squared resid    0,041369   S.E. of regression   0,056411
R-squared            0,818895   Adjusted R-squared   0,804964
Log-likelihood       22,91550   Akaike criterion    -41,83099
Schwarz criterion   -40,41489   Hannan-Quinn        -41,84608
rho                  0,548046   Durbin-Watson        0,727709

Step 4: testing for a unit root in uhat

Augmented Dickey-Fuller test for uhat
including one lag of (1-L)uhat
sample size 13
unit-root null hypothesis: a = 1

  model: (1-L)y = (a-1)*y(-1) + ... + e
  estimated value of (a - 1): -0,774593
  test statistic: tau_c(2) = -4,77677
  asymptotic p-value 0,0003851
  1st-order autocorrelation coeff. for e: -0,218

There is evidence for a cointegrating relationship if:
(a) The unit-root hypothesis is not rejected for the individual v
(b) the unit-root hypothesis is rejected for the residuals (uhat)
    cointegrating regression.
```

Figure 9 Engle-Granger test
Source: own processing in GRETL

model: $y = 2.28 + 0.64x$, which shows that "food and non-alcoholic beverages" account for 64% of expenditures spent on recreation and culture. In other words, expenditures spent on food and non-alcoholic beverages are by 36.35% lower than expenditures on recreation and culture. The results were also confirmed by the Engle – Granger Cointegration Test (Figure 9).

Consequently, we tested short-term dynamics between these expenditure categories using a regression model designed from the first differences of the logarithmic shape of expenditure categories and from the correction member (residuals offset by two periods) to see how fast the balance between these categories was restored (Figure 10).

Based on the regression model, we can conclude that the model as such is statistically significant. Statistically significant is also the first difference of the logarithm shape of

Model: OLS, using observations 2003-2015 (T = 13)
Dependent variable: d_l_Potraviny_nealkoholicke_n

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	0,00460944	0,00852569	0,5407	0,6006	
d_l_Rekreacia_kultura	0,620681	0,119771	5,1822	0,0004	***
uhat1_2	−0,730412	0,184046	−3,9686	0,0026	***

Mean dependent var	0,020029	S.D. dependent var	0,051270
Sum squared resid	0,008310	S.E. of regression	0,028826
R-squared	0,736566	Adjusted R-squared	0,683880
F(2, 10)	13,98011	P-value(F)	0,001269
Log-likelihood	29,36328	Akaike criterion	−52,72655
Schwarz criterion	−51,03170	Hannan-Quinn	−53,07492
rho	−0,337465	Durbin-Watson	2,241250

Figure 10 Regression model of the selected expenditure categories with a correction member
Source: own processing in GRETL

the category "recreation and culture" what in the short term can be interpreted as follows: if expenditures on recreation and culture change by one percentage point, expenditures on food and non-alcoholic beverages will change by 0.62%. The correction member (-0.73) is statistically significant, which means that in case of disturbing the balance between the two expenditure categories, the balance can be corrected by 73% within two periods.

It can be, therefore, concluded that there is no long-term balanced relationship between COICOP expenditure categories, i.e., regression relationships between different categories of expenditures are false regressions. The only exceptions are expenditures spent on food and non-alcoholic beverages and expenditures spent on recreation and culture, where the long-term balanced relationship is characterized by cointegration regression. In this case, the expenditures on food and non-alcoholic beverages account for 64% of expenditures on recreation and culture.

Conclusion

Household income is one of the basic indicators of the living standards of the population. It affects the size and structure of household expenditures (Rozborilová, 2002) and allows statistical analysis of the living standard of the population (Vojtková and Labudová, 2010). Household income can be analysed through several categories of income. Equivalent disposable income is the most transparent one as it takes into account the size and structure of households.

Similarly to income, household expenditures can also be analysed through several categories. Gross, net as well as consumption expenditures of households showed similar development in the monitored period 2005–2015. All three groups reached their maximum in 2015 (net cash expenditures of € 354.53 person^{-1}.month^{-1}, gross cash expenditures of € 418.82 person^{-1}.month^{-1}, consumption expenditures of households of € 310.21 person^{-1}.month^{-1}).

Based on the Classification of Individual Consumption by Purpose (COICOP), the expenditures are divided into 12 categories. Consumption expenditures spent on food and non-alcoholic beverages decreased by 5.1 p.p. in the monitored period, similarly a decrease was recorded in case of expenditures spent on housing, water, electricity, gas and fuels (by 2.9 p.p.). Expenditures used on clothing and footwear, as well as expenditures on alcoholic beverages and tobacco decreased only slightly. On the contrary, in

the monitored period, the largest increase in consumption expenditures was recorded in the category "transport" (by 5 p.p.) and the category "mail and telecommunication" (by 1.3 p.p.). The lowest increase was found in case of expenditures spent on education (by only 0.1 p.p.).

There is no long-term balanced relationship between the COICOP expenditure categories. The only exceptions are expenditures spent on food and non-alcoholic beverages and on recreation and culture, where the long-term balanced relationship is characterized by the cointegration regression, according to which the expenditures on food and non-alcoholic beverages account for 64% of expenditures spent on recreation and culture. In the event of balance disturbing between the two categories, 73% of this imbalance will be corrected in two periods.

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THIRD SECTOR INSTITUTIONS AT THE LOCAL LEVEL AND THEIR IMPACT ON HUMAN DEVELOPMENT

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In the paper, we analyse the relationship between third sector local institutions, which represent a component of social capital, and human development at the level of Slovak municipalities. In order to measure human development we use modified human development index, reflecting unemployment, level of education and gross mortality rate. We hypothesize that third sector institutions acting at the local level have a positive impact on human development. We utilize regression analysis in order to reveal this relationship, using cross-sectional data. Statistical results confirm our hypothesis. There is a positive and statistically significant relationship between the number of civic associations and the level of the human development index, even when filtering out other impacts, including self-government organizations per 1,000 inhabitants and net assets of the municipality per inhabitant. This result may be explained by the concept of social capital, meaning the network of interest-group relationships has a positive impact on providing services, governance and better access to less accessible forms of capital.

Keywords: local institutions, voluntary associations, social capital, human development

Institutions play an important role in ensuring the competitiveness of regions and their ability to face the challenges of contemporary world. Douglass C. North (1990) defined institutions as humanly created constraints creating a structure in human interaction. They represent the rules according to which the interaction between actors functions, and they are also organizations that implement these rules to achieve their goals (World Bank, 2002). Institutions are not a part of natural resources, neither they are physical objects created by human beings. They are a feature of the human population of a given society (Davis, 2010).

Many institutions operate at a national level. However, local institutions are much more important in improving the performance of local and regional economies (Martin and Sunley, 2003). Local institutions are important because they can eliminate uncertainty and instability. They can strengthen participation, resolve conflicts and secure connections with external actors (Uphoff and Buck, 2006). Local social institutions provide services essential to meeting the physical, social and cultural needs of the community (Flora et al., 1992). In the context of sustainable rural development, the importance of local institutions is increasing. High et al. (2005) believe that to understand the organizations and institutions which create them also means to understand a significant part of rural development.

Formal institutions at the level of smaller territorial units include local and regional self-government, legislation and conventions. However, informal relationships and bonds among actors are considered the most important (Clingermayer and Feiock, 2001). Informal institutions include standards, traditions, social conventions, interpersonal contacts, relationships and informal networks (Roriguez-Pose and Storper, 2006). A significant comparative advantage of rural areas is the high density of informal institutions. In general, one of the features of rural areas is the reciprocity and solidarity of the rural population, local habits and traditions (Binek et al., 2009).

The cause of the importance of relationships and contacts of social groups and networks, trust in community members is explained by the concept of social capital (Fukuyama, 1995). Social capital is a resource that can be utilised even by communities with limited access to other resources – to human, physical or financial capital (Woolcock, 2002). It is the local level that is significant in the context of social capital. This is where shared norms and shared values prevail, and there is the highest number of interactions among economic actors. The rich network of relationships between interest groups and local public institutions then positively influences infrastructure building and service provision, investment and better governance. It plays an important role in local development (Jēkabsone and Sloka, 2016). The importance of informal relations in the context of rural development in Slovak conditions was confirmed by Melichová (2015).

However, it is not optimal for relations among actors to be based only on mutual trust. As Fukuyama (1995) asserts, there is a complementary relationship between social capital and formal institutions – formal institutions need to be established. Without them a community with

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a high supply of trust and community spirit faces barriers to their further development. Conversely, if formal institutions are established, they are essentially useless if individuals exploit them in order to achieve personal goals.

For individuals, voluntary associations are often the most common way to get involved in community life (Binek et al., 2007). Membership in them is more common in rural areas, and it is also common to have membership in more than one voluntary association (Svobodová et al., 2011). The importance of civic engagement in the form of voluntary associations is underlined by Putnam (1993, 2000). He claims that differences in regional development are explained by differences in the stock of social capital that is represented by civil society, institutional performance and local self-government. Voluntary cooperation is therefore easier in a community where reciprocal relationships and networks of civic engagement are created. The effective use of social capital is then an important task for the community.

Many studies have dealt with the impact of social capital on economy, namely on economic growth, unemployment, corruption or government performance. Most studies looked at the effects of social capital at state or regional level but only a few addressed this issue at the local level (Cofee and Geys, 2005). Economic development should ultimately be reflected in human development and in ensuring a higher quality of life for the affected community. Human development does not only mean an increase in income but also a satisfaction of needs such as health care or education. These are provided not only by the public sector but also by social and political institutions (Flora et al., 1992; Christoforou, 2010).

Material and methods

The aim of the paper is to examine the impact of local institutions on human development in Slovak municipalities. Particularly, we examine the relationship between human development and civic associations as a component of social capital. In order to investigate the relationship, we compile a regression model consisting of cross-sectional data for 2015. We used the data from the Statistical Office of the Slovak Republic, 2011 Population and Housing Census, Register of economic organisations of SR, and the database on municipality economies of INEKO. We hypothesize there is a positive relationship between social capital, expressed by its component – civic associations, and the modified human development index.

The modified human development index, constructed in a similar fashion as the index constructed by Humlerová (2013), serves as a dependent variable. This indicator is comprised of three dimensions: level of education, life expectancy and economic conditions. In its original form, it is used to measure human development at national level (UNDP, 2016). At municipal level, data for its calculation is not available. Therefore, it is replaced with alternative indicators. We use 2011 weighted education index (1) to reflect the level of education. It is based on the number of years of study and from among the partial indicators it resembles the original indicator to the greatest extent:

$$weighted\ education\ index = \frac{\sum_{i=1}^{12} w_i\ population}{adult\ population}$$

where:

w_i = (number of completed years of study i)/9 for i = 1, 2, … 12

Life Expectancy is replaced by gross mortality rate and the dimension of economic conditions (Income Index) is represented by unemployment. Since there is no data on the economically active population at municipal level, it is represented as the available number of job seekers divided by the number of the productive population. Since indicators representing individual dimensions of human development are measured in different units, it is necessary to standardize them. Standardization is performed using the max – min method (2), which guarantees values in the <0, 1> interval:

$$z_i = \frac{x_i - \min(x)}{\max(x) - \min(x)}$$

where:

$x_i = (x_1..., x_n)$ and zi represents standardized values

Unlike the other two sub-indicators, higher values of weighted education index are positive phenomenon. Therefore, we use inverted value of this indicator, more precisely its standardized value substracted from one. In the next step, the index itself (3) is calculated as the mean of the standardized values of individual indicators. Considering the rather cumbersome interpretation, resulting index is then inverted again. Therefore, the increasing value of these indicators indicates a higher level of human development:

$$HDI_i = 1 - \left(\frac{life\ expectancy\ index + (1 - education\ index) + income\ index}{3} \right)$$

where:

HDI_i – represents human development index of the municipality i

Activities of civic associations can be measured by their number, total number of their members per capita or the frequency of its member's meetings (Rupasingha et al., 2002). In our case the density of civic associations amounts to a total number of civic associations per 1,000 inhabitants in 2015.

In order to uncover the relationship between local institutions and human development, it is necessary to filter out the possible impact of other determinants. In our models, we include a series of control variables. We also control the impact of public administration institutions, represented by budgetary and

Table 1 Overview of variables and their descriptive statistics

Variable	Description	Mean	Median	S. D.	Min	Max	Source
DENSITY	population density	110.54	58.82	382.13	1.3	13,692	Datacube, 2015
MP	the mid-year population	1,856.9	665.5	5,828	11	104,165	Datacube, 2015
CP	crude rate of population change	0.0591	0.000	23.4	-353	277	Datacube, 2015
AMW	district average gross nominal monthly wage by labour force sample survey	828	812	106	636	1,446	Datacube, 2015
UNEMP	district registered unemployment rate	13.1	12.2	5.58	4.67	27.4	Datacube, 2015
BUILT	built-up area share	0.0519	0.0431	0.0473	0.00364	0.801	Datacube, 2015
HF	health facilities per 1,000 inhabitants	0.645	0.000	1.75	0.000	40.8	Datacube, 2015
VA	voluntary associations per 1,000 inhabitants	7.14	5.91	6.33	0.000	97.6	Register of economic organisations of SR
MORG	budgetary, contributory and other organisations owned by municipality per 1,000 inhabitants	0.575	0.000	1.08	0.000	24.1	Register of economic organisations of SR
ASSETS	net assets per inhabitant	2010.9	1616.4	1838.7	-6,967.3	42,055	INEKO, 2015
PREPR	pre-productive age group share	15.4	14.6	5.18	1.69	45.5	Datacube, 2015
POSTPR	post-productive age group share	15.5	15.0	4.79	1.20	55.8	Datacube, 2015
HDI	constructed human development index	0.681	0.696	0.0691	0.307	0.852	Datacube, 2015; SODB 2011

Source: own processing

contributory organizations, as well as by various other less common organizations owned by municipality per 1,000 inhabitants. In addition to the number of organizations, we use net municipal assets per inhabitants, assuming higher net assets per capita increase the ability of self-government to meet the needs of its inhabitants. Table 1 shows descriptive statistic of used variables. After adding control variables, the regression model has the following form:

$$HDI_i = \beta_0 + \beta_1 \ln(\text{DENSITY}_i) + \beta_2 \ln(\text{MP})_i + \beta_3 CP_i + \beta_4 AMW_i + \\ + \beta 5 UNEMP_i + \beta_6 BUILT_i + \beta 7 HF_i + \beta 8 PREPR_i + \beta_9 POSTPR_i + \\ + \beta_{10} MORG_i + \beta_{11} ASSETS_i + \beta_{12} VA_i + \varepsilon_i$$

where:
i = 1, 2... 2,861 represents municipalities in Slovakia

Results and discussion

Table 2 shows regression models estimated using the OLS method. Since heteroskedasticity has been detected, we use robust standard errors estimate. Regarding the presence of multi-collinearity of independent variables, low VIF values indicate that the results are not affected by multi-collinearity (Hair et al., 2014).

In the first model (1), we do not take the effects of voluntary associations into account. Variables in the model explain approximately 57% of the variability of the modified human development index and the overall model is statistically significant. Most coefficients of control variables are statistically significant. There is, therefore, a statistically significant relationship of the human development index, for example, with the district registered unemployment rate, district average gross nominal monthly wage or crude rate of population change. As we expected, population density affects the level of human development index positively. With rising density, various commercial, educational and other facilities will be localised in these municipalities providing their inhabitants with sophisticated goods and services. This is evident also from the positive relation of dependent variable with the number of health facilities. The size of the municipality, represented by the number of inhabitants does not have a statistically significant impact on the human development index. With regard to public administration institutions, in the case of the number of organizations themselves, the relationship between the variables is negative but not statistically significant. We explain this by the nature of the organizations making up this variable – a substantial part (80%) consists of budget and contributory organizations, namely school facilities. In the context of social capital, some authors (Kubišová, 2016; Svobodová et al., 2011; Kadeřábková and Trhlínová, 2006) attribute some importance to school facilities. They point out that school facilities provide a place for people to meet in a village. They are involved in the development of social and cultural life through the preparation and implementation of various activities. If there is no space in the municipality for the organization of social and cultural events, the social life of the population is diminishing and so is their cohesion. There is a positive relationship between the human development index and the value of net assets per capita. Municipal amenities may be to a certain extent represented by the net municipal assets per capita.

In the second model (2), we include the number of voluntary organisations representing local institutions. We test the hypothesis whether local institutions affect human development. We observe a minor increase in

Table 2 Regression analysis results

Dependent variable: HDI	(1)	VIF	(2)	VIF
const	0.7396**	–	0.7413**	–
	(0.01642)		(0.01647)	
Ln(DENSITY)	0.02007**	4.385	0.02168**	4.506
	(0.001849)		(0.001943)	
Ln(MP)	0.001771	2.972	0.001792	2.972
	(0.001257)		(0.001239)	
CP	0.0006882**	1.247	0.0006847**	1.247
	(7.060e-05)		(6.752e-05)	
AMW	4.036e-05**	1.918	3.373e-05**	1.942
	(1.014e-05)		(1.023e-05)	
UNEMP	-0.004238**	1.976	-0.004378**	2.005
	(0.0002369)		(0.0002422)	
BUILT	-0.1005**	2.34	-0.1264**	2.412
	(0.02181)		(0.02347)	
HF	0.002555**	1.333	0.002446**	1.334
	(0.0005034)		(0.0005472)	
PREPR	-0.006870**	2.087	-0.006907**	2.089
	(0.0003029)		(0.0003028)	
POSTPR	-0.001375**	2.279	-0.001629**	2.350
	(0.0003586)		(0.0003555)	
MORG	-0.0004368	1.087	-0.001259	1.125
	(0.0009933)		(0.0009046)	
ASSETS	1.028e-06**	1.065	8.690e-07*	1.069
	(5.055e-07)		(5.048e-07)	
VA	–	–	0.0008034**	1.239
			(0.0002624)	
Adj. R^2	0.5745	–	0.5788	–
F	233.33**		218.08**	

Source: own processing
Robust standard errors in brackets. *significant at 10%, **significant at 5%, N = 2861

explanatory variability of dependent variable. The model remains significant. By adding this variable, we observe that significance level of the variable Net assets per inhabitant has decreased. This could indicate that after taking the activities of voluntary organisations into account, net assets of the municipality are not so important. Coefficients of other control variables remain statistically significant at the same level. The hypothesized relationship between voluntary associations and dependent variable is confirmed – it is positive and statistically significant. Regression results offer evidence that social capital, in the form of voluntary associations' activity at municipal level, is positively related to human development, meaning that municipalities with a higher number of voluntary associations enjoy higher level of human development. This was also observed by Christoforou (2010), who investigated this relationship at the level of European countries. The functioning of various associations can therefore stimulate creation and reinforcement of networks that link individuals of a given community. These networks subsequently help generate trust to other members of the community and its institutions. It also guides actors to abide norms and facilitates reciprocal behaviour. This subsequently leads to improved cooperation, coordination and participation of regional and rural development actors (Putnam, 1993). Kubišová (2016) regards associations linking diverse individuals (in terms of age, education or social status) as the most beneficial for the process of integration. As an example, she mentions sport clubs (with the exception of clubs with homogenous member base), folklore ensembles, tourist associations, and local development associations.

Since the research shows that membership in associations is positively tied to the level of human development in the given municipality and we explain this by the concept of social capital, it is implied that municipal officials need to utilize social capital in the development of the municipality as any other type of capital. In the past, life in Slovak rural communities has been characterized by a high degree of reciprocity, mutually recognized values and norms. Presently, we can see that this may no longer be the case, limiting the potential of their development (Gajdoš and Pašiak, 2008). In economic development, municipalities utilize social capital inadequately (Kubišová, 2016) and also inhabitants themselves do not realize that, by their activities, they can contribute to the development of their municipalities or regions. It is necessary for any municipality to support inhabitants in setting up voluntary associations and also to act as a co-founder. For municipalities, local associations are also interesting because of the possibility of gaining resources as local organizations can be involved in wider social networks across sectors, enabling them to promote their agenda.

Even though positive and statistically significant relationship between modified human development index and number of voluntary associations per 1,000 inhabitants has been confirmed, the presented model possesses several limitations. Since cross-sectional data is used, its ability to explain causal relationships is limited. In order to reveal true causal relationships between variables, it is necessary to perform regression analysis on panel data. The second limitation is the inability to determine the direction of causal relations. Even though there is a positive relationship between explored variables, there is a possibility that causality is reversed – high level of human development may influence the level of social capital in a municipality. Another limitation is the examined independent variable itself. Individual voluntary associations vary significantly. They are characterized by diverse fields of interests, number of their active members, and scope of their activities. Data specifying number of their members or actual activities performed by those members is not available. Therefore, by using the data available to us, we are not able to determine the actual activities of the voluntary associations.

Conclusion

Several studies dealing with social capital have shown that increased trust among community members and its institutions and reciprocal relationships play an important role in local development. Our analysis explored the relationship between third sector institutions at the local level and human development of Slovak municipalities. In order to reveal this relationship, we have employed regression analysis. Modified human development index has been constructed to serve as a dependent variable and we have used the number of voluntary associations per 1,000 inhabitants as an independent variable. In order to filter out influence caused by other factors, other variables have been included in the analysis, for example number of organisations owned by municipality or net assets per inhabitants. The results of the analysis have confirmed our hypothesis. The regression model has revealed the existence of positive statistically significant relationship between activities performed by local institutions represented by their number per 1,000 inhabitants and a constructed index of human development. The existence of voluntary associations contributes to the creation of dense network linking actors of local and regional development. Cooperation of these actors is subsequently more efficient and they have access to other forms of capital. As a result, whole communities benefits from their activities. Regarding organisations owned by municipalities, these have proved not significant in the model. On the other hand, there is the statistically significant positive effect of net assets per inhabitant; however, its effects have proved as less significant after the inclusion of voluntary association into the model. The amount of net assets per inhabitant may indicate the level of civic amenities in the given municipality, therefore in the context of social capital it may represent a space where inhabitants and members of associations can meet and strengthen community cohesion. Due to the limitations of cross-sectional data, panel data has to be analysed in the future to allow for the detection of causal relationship between variables.

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